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83D CONGRESS 2d Session	SENATE	REPORT No. —

ACCESSIBILITY OF STRATEGIC AND CRITICAL MATERIALS TO THE UNITED STATES IN TIME OF WAR AND FOR OUR EXPANDING ECONOMY

REPORT

OF THE

MINERALS, MATERIALS, AND FUELS ECONOMIC SUBCOMMITTEE

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

EIGHTY-THIRD CONGRESS

PURSUANT TO

S. Res. 143

A RESOLUTION TO INVESTIGATE THE ACCESSIBILITY AND AVAILABILITY OF SUPPLIES OF CRITICAL RAW MATERIALS

Printed for the use of the Committee on Interior and Insular Affairs

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LETTER OF SUBMITTAL

JUNE 23, 1954.

Hon. HUGH BUTLER,
Chairman, Committee on Interior and Insular Affairs,
Senate Office Building, Washington, D. C.

DEAR SENATOR BUTLER: We are herewith submitting to you the report containing recommendations and findings in conformance with Senate Resolution 143 of July 28, 1953, directing "full and complete investigation and study of the accessibility of critical raw materials to the United States in time of war" and "to study and recommend methods of encouraging developments to assure the availability of supplies of such critical raw materials adequate for the expanding economy and the security of the United States."

The Minerals, Materials, and Fuels Economic Subcommittee conducted 58 hearings over a period of 10 months, and heard over 360 witnesses.

The report also includes a summary of the evidence for the benefit of the committee.

Sincerely yours,

GEO. W. MALONE, *Chairman.*
EARLE C. CLEMENTS.
FRANK A. BARRETT.
JAMES E. MURRAY.

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ACCESSIBILITY OF STRATEGIC AND CRITICAL MATERIALS TO THE UNITED STATES IN TIME OF WAR AND FOR OUR EXPANDING ECONOMY

----------.—Ordered to be printed

Mr. ----------, from the Committee on Interior and Insular Affairs, submitted the following

REPORT

[Pursuant to S. Res. 143]

INTRODUCTION

AVAILABILITY OF CRITICAL MATERIALS IN TIME OF WAR

For the first time in the history of the United States Senate, a Senate subcommittee was directed to conduct an overall investigation of the accessibility of critical materials to the United States in time of war, particularly as to its effect on the security of the Nation.

The testimony before the committee is alarming: To a very dangerous extent, the vital security of this Nation is in serious jeopardy. We are dependent for many of our essential raw materials on sources in far-off lands, many under the control of possible fickle allies or timid neutrals, some veritably under the guns of our potential enemies.

And what is perhaps a more devastating conclusion of this committee is that none of this vulnerability need exist. Long overdue corrective measures should be undertaken at once.

The Minerals, Materials, and Fuels Economic Subcommittee of the Interior and Insular Affairs Committee derived its authorization by Senate Resolution 143 of July 28, 1953. It was directed to:

1. Determine the accessibility of the critical raw materials to the United States during a time of war.
2. Recommend methods of encouraging the production of the critical war materials adequate for the expanding economy and the security of the United States.

In pursuance of these directions, the subcommittee conducted hearings over the past 10 months from coast to coast and examined

more than 360 witnesses. The most distinguished engineers, military authorities, scientists, and experts familiar with the problems of securing essential raw materials during wartime contributed their counsel and advice to the committee.

The subcommittee concentrated its examination on a total of 77 raw materials which the Secretary of Defense declares are indispensable and essential in conducting modern warfare and which we have acquired by imports from abroad.

The committee adopted at the outset three general areas of investigation vital to our national defense and to the maintenance of our national economy:

1. A study of the area from which critical materials will be available to the United States in time of war.
2. The degree of self-sufficiency that can be established within that area.
3. The congressional policy under which maximum economic self-sufficiency can be established in this Nation.

The investigation and report come at a very critical and uncertain period in the affairs of this Nation—when new and improved methods of offense and defense must be weighed and considered. Laboratory developments and discoveries, including substitutes and replacements for critical materials—all affect the long-range welfare of our people and our relations with the people of the Western Hemisphere and with the world.

The availability of critical materials essential to the defense of our country and which are vital to our civilian economy have strongly influenced our foreign policy. The known availability of the necessary critical materials in the Western Hemisphere, in an area that we can defend, should have a real impact on future foreign policy and defense decisions.

The Western Hemisphere can become completely self-sufficient in the production of the necessary critical materials in time of war. This Nation can materially increase its own economic production of strategic and critical materials by strengthening its laws regulating foreign trade. Congress cannot shirk its duties in this area.

The printed hearings, covered in this report, are divided into 10 parts as follows:

Part 1. Bureau of Mines
Part 2. Stockpile
Part 3. Titanium
Part 4. International Materials Conference
Part 5. Commodity trade agreements
Part 6. Fuels
Part 7. Tariffs and taxes
Part 8. Paley Commission, staff study
Part 9. Uranium, columbium, cobalt, rutile, and strategic agricultural products
Part 10. Industry

COMMITTEE RECOMMENDATIONS

The availability of critical and strategic materials are vital to military security and to an expanding domestic economy. National survival in time of war depends on ample and uninterrupted supplies of the 77 such materials included in the report. To assure that imperative needs of the United States be met:

1. We recommend the closest cooperation among the nations of the Western Hemisphere, which is the only dependable source of the necessary critical materials in time of war. This area can be defended and can be made self-sufficient in the production of such materials. We recommend that the spirit of the 130-year-old Monroe Doctrine prevail in our relations with the nations of the Western Hemisphere.

2. We recommend that Congress insure that the regulation of foreign trade conforms to the principles thus laid down in article I, section 8, of the Constitution thus assuring the American workers and investors access to American markets.

3. We recommend eliminating our Nation's present dependency upon remote and possibly unfriendly or neutral areas of the world for the critical materials, without which we cannot conduct a war.

The only tin smelter in the Western Hemisphere is in Texas City, Tex. The continued operation and maintenance of this smelter is essential to our security. The capacity meets our wartime needs.

4. We recommend increased depletion allowances to producers of critical minerals and materials as a further incentive to production.[1]

Further studies should be made of the Canadian method of delayed taxation in connection with such critical mineral and material development.

5. We recommend acceleration of the Federal program of stockpiling critical and strategic minerals and materials to assure ready supplies in the event of war and coordination of this program with "going concern" production industries in the Western Hemisphere to assure continuation of necessary supplies under stress of war.

6. We recommend studies with a view to improve petroleum, gas, and coal resources and develop them to assure maximum availability of domestic fuels for both the peacetime economy and national security. Such studies should determine whether present regulations are unduly restrictive of our own resource expansion and reserves, and if so, regulations should be adjusted to maintain our self-sufficiency in these vital fuels.

7. We recommend increasing the production goal for titanium to 150,000 tons annual minimum without delay. Titanium is a new wonder metal. This is a military must. Contracts should be awarded

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[1] Present percentage of depletion allowance:

Mineral:	*Percentage of gross income*
Oil and gas properties	27½
Sulfur	23
Metal mines—practically all types	15
Uranium	15
Coal	10
Sand, gravel, slate	5

without delay by the Government to qualified concerns prepared to contribute toward this goal. Civilian demands are tremendous for this heat resistant high-strength-weight-ratio, noncorrosive, nonmagnetic metal.

This metal can become the basis for a $5 to $10 billion new civilian industry. Production of the long-range supersonic speed bombers and the necessary fighter planes will make obsolete any nation's air equipment built without it.

8. We recommend that goals for production of uranium for fuel be made adequate to meet both military and civilian requirements. Hemisphere self-sufficiency in uranium for fuels can be attained. A liberal long range market price must be maintained as long as Government control is necessary for security. A tremendous civilian potential use of uranium is assured based on nuclear power for industry.

9. We recommend a review of the work of the Securities and Exchange Commission by the appropriate committees of Congress to clarify its duties and responsibilities. The sale of securities affects the strategic materials program. It is recognized that the commission should assure full and complete information to potential purchasers of securities, and that its responsibility does not include determination of feasibility. Such congressional committee review should consider the advisability of a requirement that a thorough and confidential inquiry should precede any public announcement of an investigation of offered securities.

10. We recommend determination by the Congress, through appropriate committees, of the precise duties and relationships between the multiple (approximately 38) agencies and branches of our Government responsible for stockpiling operations of critical materials.

The determination of these duties should precede the appropriation of funds for these agencies with the aim of facilitating their work and of fixing responsibility for the proper coordinated objectives.

11. We recommend appropriations of $50 million annually to establish and operate a comprehensive 5-year program of laboratory, pilot-plant, and exploratory research into improved methods of beneficiation of critical materials and the study of substitutes, including synthetics and replacements.

We approve the research and studies conducted by the Bureau of Mines on the low-temperature carbonization of coal and we recommend that adequate funds be appropriated to conduct extensive studies and investigations of ways and means to revive the coal industry. These funds should be made available to be used independently or in conjunction with responsible privately operated companies and organizations.

It is recommended that research and pilot-plant work be continued. That the erection of a large-scale oil-shale plant be considered by industry in cooperation with the Government. Such plant would endeavor to advance the production of petroleum fuel on a commercial basis, and it would be available in a war emergency.

12. We recommend rejection of international controls of production, prices, and supplies of critical and strategic materials unless by legislative action by the Congress of the United States.

FINDINGS

The findings include conclusions developed from the 10 parts of published testimony and are the foundation for the 14 recommendations for the United States Senate. This is in conformance with Senate Resolution 143 directing the committee to determine the accessibility of the critical materials to this Nation in wartime, and for our expanding economy and security.

1. The Western Hemisphere can be defended and will be the only dependable source to the United States of critical raw materials in the event of an all-out war.

The delivery of any such critical materials to the Nation across a major ocean during such a conflict will be highly problematical.

The evidence indicates that it now is possible for the enemy to destroy the production of critical materials at their source and, in any case, sea lanes will be even more difficult and costly to depend upon than was the case during prior wars.

The Western Hemisphere can be made self-sufficient in the production of critical materials which are essential in war.

Since the testimony of competent witnesses indicates that the Western Hemisphere will be the only dependable source of critical raw materials in the event of an all-out world war, it is imperative to the security of this Nation and to the nations of the Western Hemisphere that we and they foster the greatest measure of self-sufficiency in the production of such materials and continually study all possible devices that will encourage the expansion of hemispheric production in this vital field.

It is vital to our domestic welfare economy and security that maximum economic production be maintained, first, within our own borders and, second, in the Western Hemisphere.

2. During the last more than a quarter of a century established procurement practices have dangerously increased our dependence for the critical materials upon nations across major oceans without which this Nation cannot survive.

We must avoid dependence upon overseas suppliers to the extent that these suppliers could suddenly render us impotent by withdrawing supplies of critical materials during a world conflict, or could use such dependence as a political or economic bargaining lever.

Testimony is abundant that our domestic and foreign policies have been based on the false assumption that the United States is a have-not nation insofar as the supply of critical raw materials necessary to this Nation in wartime is concerned.

This testimony also shows that in many instances the United States has expended enormous sums of money to underwrite foreign fiscal systems and world policies of nations whose friendship is deemed of

great importance because of their control and possession of raw materials.

This misconception that we are a have-not nation has found wide acceptance by the public through confusion between the statistical and engineering terms, "proved commercial reserves" and "potential and latent resources," which include developed ore, probable ore, possible or inferred ore to designate supplies of ore in various states of development.

This confusion has led to predictions over the past two decades that we would soon exhaust our supplies of petroleum, iron ore, copper, lead, zinc, tungsten, mercury, and other critical materials. Expert testimony before this subcommittee made it crystal clear that there were more known commercial reserves of critical materials in the United States than ever before in the history of this Nation.

In the meantime we have consumed more than the total quantity of proven commercial reserves of two decades ago.

The potential latent resources or reserves are more than ever susceptible to discovery today by modern techniques and exploration methods, requiring only a financial incentive to be found.

Evidence was presented which showed that this country was led into the mistaken conclusion that, according to the known reserves of critical materials, including petroleum, tungsten, manganese, zinc, lead, and other minerals, "we would exhaust our supplies and they would be virtually depleted" within 2 to 12 years.

Documents were introduced into evidence which stated that in 1944 the Government was advised to conserve its minerals and that it should purchase some critical materials from foreign countries, including Russia. It was testified that this advice played a part in the subsequent increase in United States dependence on foreign nations for critical materials which are available in this Nation and in the other areas of the Western Hemisphere.

3. Less than 1 percent of the areas of this Nation has been included in geological investigations; only 12.7 percent has been geologically mapped, and 31.1 percent topographically mapped by the United States Geological Survey; and that the Survey started its mapping work in 1880.

4. The evidence indicates that Federal tax laws definitely retard the production of critical materials in this Nation.

The principle of depletion allowance has materially increased the known reserves of petroleum and natural gas and if extended to other critical materials would increase the incentive to discover and develop additional supplies.

5. The United States cannot possibly exhaust its present and potential fuels supply including petroleum and coal in the foreseeable future. The absolute necessity for going-concern industries cannot be overemphasized. This is particularly essential where materials cannot be stockpiled, as coal and petroleum. Testimony is conclusive that the petroleum industry is a thriving going-concern business growing through the effect of a continually increased market and the tax policies including depletion allowances, but emergency dependence must be on the going-concern industry.

Enormous oil reserves are found in the shales and/or coal of Colorado, Wyoming, Utah, Kentucky, Indiana, and Ohio, as well as in Canada. It has been estimated these shales contain over 200 billion barrels of

oil. Experimental work by the Union Oil Co. and Bureau of Mines in pilot plant operation shows that petroleum production from this source is entirely practicable and that vast amounts of oil may be produced in the foreseeable future. The Green River formation in Colorado alone has been described as an area of 1,000 square miles with an underlay of oil shale 500 feet thick averaging a recovery of 15 gallons of oil per ton.

Coal reserves are unlimited for energy demands as well as for petroleum production. The coal industry is in a state of decline and steps should be taken and studies should be made with a view to expanding the uses of coal.

An International Materials Conference was established in December 1950 by the State Department without the express consent of Congress. It was testified before the subcommittee that the IMC was set up in lieu of the International Trade Organization which Congress had refused to ratify at an earlier date.

There is evidence before the subcommittee that the operations of the IMC and international control of production and consumption allocations may have depleted and retarded fulfillment of stockpile objectives.

The IMC has now been discontinued. A new effort to establish a similar international organization is currently in progress in the United Nations Economic and Social Council, based on a resolution passed by that body on April 30, 1954.

An international organization, setting up controls over the distribution of the production and consumption of the world's goods could inhibit our own going-concern industries.

7. Ore is a mineral aggregate that can be extracted at a profit. Through properly regulated foreign trade the incentive for risk capital necessary to develop additional reserves and establish a going-concern critical-material industry will be available.

8. Mines once closed down require years of time and tremendous investments to reopen. With experienced workers and technical staffs widely scattered, machinery liquidated, mines flooded and caved, much of our once available reserves are destroyed, and prospecting for new reserves is discouraged. Failure to realize the situation could mean tragedy to our economy and our material security.

9. Numerous administrative agencies and departments of the Government are involved in the stockpile program, or in efforts to increase the production of critical materials. They act independently of each other and none are charged with the complete operation. Many are not cognizant of the end objectives of the program. Their activities are marked by confusion and delay, frequently defeating the intent of Congress.

10. The Securities and Exchange Commission's "purpose is to provide full and fair disclosure of the character of securities sold" and "to prevent fraud." Complaints were made that the discovery and development of new minerals was retarded by actions of the Securities and Exchange Commission in that it improperly attempted to determine the feasibility of an enterprise and in that public announcements of investigations of securities sales were made prior to confidential inquiries justifying such announcements.

The Chairman of the Securities and Exchange Commission assured the committee that "the Commission does not pass upon the merits

of any security or feasibility of an enterprise offering securities for public sale." The Commissioner also stated that there would be no publicity given to any administrative investigations before the Commission authorized a public hearing or announces a public investigation.

11. Titanium production is a must. It is a wonder metal without which this Nation cannot produce the most effective bomber plane flying at supersonic speeds with a range of five to seven thousand miles. Titanium will increase both the range and speed of these planes.

(*a*) This Nation needs a minimum production of 150,000 tons of titanium annually. The manufacture of the proper type of military planes without this wonder metal is impossible. We are producing approximately 2,000 tons annually.

(*b*) Three agencies share the responsibility for the production of this indispensable lighter, heat-resistant metal, which is far stronger than aluminum, and less than half the weight of steel. The Secretary of Defense, the Office of Defense Mobilization (ODM), and the General Services Administration (GSA) work on the program. The ODM represents the consolidation of about 15 such agencies.

(*c*) In 1953 the Secretary of Defense recommended the production of 35,000 tons of titanium annually by 1956. The ODM reduced the figure to 25,000 tons and up to September 21 of that year the GSA had let contracts for 13,200 tons and the actual annual production was little over 2,000 annual tons.

As of May 15, 1954, the Secretary of National Defense still recommends the production of only 35,000 tons, the ODM will permit contracts up to 37,500 tons. The GSA is now in process of negotiating additional contracts for an additional 16,500 tons per annum.

There is no provision for checking the contractees and for facilitating the work. Australia now furnishes the rutile for the Henderson, Nev., plant where two-thirds of the production is located—and India furnishes most of the ilmenite for the New Jersey plant, which is the source of the remaining one-third. Neither source would be available in time of war. There is more ilmenite in the United States and southern Canada than we can use in a century.

The industrial use of titanium, in addition to the military needs, could amount to from $5 to $10 billion annually in the near future—it is the strongest light metal known and in addition is noncorrosive, even in sea water. Many industries, including the chemical field, have announced that they can use the metal as fast as they can be assured a continuous supply.

12. The commercial use of nuclear power could be the greatest potential source of improvement, starting in the desert and mountainous areas where other fuels and hydroelectric potentials are high cost or nonexistent.

13. A stockpile of each critical material must be maintained which, coupled with going-concern production within the Western Hemisphere, will be ample to meet the military and civilian needs. Such a stockpile can be decreased as the going-concern production is increased.

The best wartime insurance of the adequacy of our supplies of critical and strategic materials is a healthy, expanding mining industry combined with well balanced, ample stockpiles.

The availability of tin is a matter of deep concern to this Nation. The far eastern resources may well prove unavailable to the United

States in any future war. The Western Hemisphere resources contained in Bolivia are more than adequate to meet the United States requirements. At present the United States Government is operating the only tin smelter in the Western Hemisphere. Recently efforts have been made to dismantle this smelter. Testimony received by the committee proves that this would be foolhardy and shortsighted. It is essential that we have a going-concern tin smelter in the United States capable of supplying the United States in the future and to supplement our stockpile requirements.

14. Laboratory research, pilot plant experimentation and exploration is important in the interest of national defense and must be implemented—for new and improved methods of beneficiating critical materials and for new uses, substitutes and replacements—and to facilitate the discovery of new reserves.

The difference in country rock and reserve ores often lies in an improved beneficiation process.

Numerous new uses for metals and materials have continually been developed over the years through laboratory work and pilot plants, among them titanium, zirconium, columbium, thorium, and uranium and new materials such as synthetic mica.

Many of these can be utilized as substitutes and replacements for scarce materials. They have opened up entirely new and unexplored fields of increased speed and power. There is every reason to conclude that if properly encouraged, much greater and broader progress in these fields lies immediately ahead.

LIST OF STRATEGIC AND CRITICAL MATERIALS

Group I

Abrasive crude aluminum oxide
Aluminum
Antimony
Asbestos, amosite
Asbestos, chrysotile
Asbestos, crocidolite
Bauxite, metal grade
Bauxite, refactory grade
Beryl
Bismuth
Cadmium
Celestite
Chromite, chemical grade
Chromite, metallurgical grade
Chromite, refactory grade
Cobalt
Columbite
Copper
Corundum
Diamonds, industrial
Fluorspar, acid grade
Fluorspar, metallurgical grade
Graphite, amorphorus lump
Graphite, crucible grade
Graphite, lubricant and packing grade
Kyanite
Lead
Magnesium
Manganese ore, battery grade
Manganese ore, chemical grade
Manganese ore, metallurgical grade
Mercury
Mica, muscovite block, good stained and better
Mica, muscovite block, stained (radio tube quality)
Mica, muscovite film
Mica muscovite splittings
Mica, phlogopite splittings
Molybdenum
Nickel
Petroleum
Platinum group metals, iridium
Platinum group metals, platinum
Quartz crystals
Rare earths
Selenium
Tin
Titanium
Tungsten
Vanadium
Zinc
Uranium
Thorium

NONMINERALS

Bristles, hog
Castor oil
Coconut oil
Cordage fibers, abaca
Cordage fibers, sisal
Cotton, extra long staple
Feathers and down, waterfowl
Hyoscine
Iodine
Jewel bearings, instrument jewel except vee jewels
Jewel bearings, sapphire and ruby vee jewels
Jewel bearings, watch and timing-device jewels
Opium
Palm oil
Pyrethrum
Quinidine
Quinine
Rubber, crude natural
Sapphire and ruby
Shellac
Silk
Talc, steatite, block
Sperm oil
Vegetable tannin extract, chestnut
Vegetable tannin extract, quebracho
Vegetable tannin extract, wattle

Group II

MINERALS

Bauxite, abrasive
Cryolite, natural
Graphite, crystalline fines
Ilmenite
Mica muscovite block, stained and lower
Mica, phlogopite block
Platinum group metals, osmium
Platinum group metals, palladium
Platinum group metals, rhodium
Platinum group metals, ruthenium
Rutile
Zirconium ore, Baddeleyite
Zirconium ore, zircon

NONMINERALS

Agar
Cotton
Diamond dies
Emetine
Optical glass
Talc, steatite, ground
Wool

SUMMARY OF EVIDENCE

The following summary of evidence, divided into 14 sections, is a résumé of testimony and statements received by the subcommittee during the course of its hearings. More than 360 witnesses appeared before the subcommittee in 58 hearings.

The witnesses expressed varying points of view, including some which were sharply conflicting and some which obviously represented a special viewpoint. Therefore, the opinions expressed in this summary of evidence do not necessarily reflect the views of all the members of the subcommittee; and they are not endorsed as being their judgments.

This summary of evidence is presented as a guide to the 10 volumes of testimony, setting forth in condensed form the voluminous material gathered during the hearings. It is presented in this form to facilitate study of the testimony received by the subcommittee and because there will be a limited number of the 10 volumes of the hearings available for distribution.

Strategic and Political Problems Affecting the Accessibility of Critical Materials

Military and political considerations affect the accessibility of critical materials to the United States both in wartime and peacetime. Problems are created by the striving by individual nations for trade advantage.

Military strategists heard by the committee on the tenable sealanes available in wartime included Charles E. Wilson, Secretary of Defense; Robert B. Anderson, Deputy Secretary of Defense; Charles S. Thomas, Secretary of the Navy; Gen. Alfred H. Johnson; Gen. Albert Wedemeyer, Gen. Bonner Fellers, Gen. Carl A. Spaatz, and Maj. Alexander de Seversky.

Political experts included the Secretary of State, John Foster Dulles, and industrial operators in foreign areas and nations where political and economic unrest might threaten the availability of the critical materials in time of actual or pending war emergency.

The following section of this report summarizes and expresses the views of these and other witnesses. Accessibility of critical materials in wartime includes ability to produce and to deliver such goods in the emergency—when the heat is on—when materiel and manpower are needed in other fields.

All substantially agreed that the Western Hemisphere would be the only dependable source for such critical materials in time of war and that deliveries from offshore areas across major oceans would be problematical to say the least.

COLONIAL NATIONS—ON THE MOVE

All substantially agreed that the populations of the colonial entities or possessions throughout the world were on the move. As long as there is a question as to whether they would remain in the century-old colonial status or join in the Communist movement, their friendship for the United States is in a state of flux and undetermined.

Testimony was to the effect that it would be unwise to place any long-range dependence upon these areas for such critical materials.

POSSIBLE NEUTRAL AREAS

In addition there were several areas such as India, for example, whose loyalty might be divided or a neutral position might be adopted in the face of threatened invasion.

Since India has stopped the shipment of monazite sands (utilized in nuclear energy) during peacetime there is no reason to expect that she would allow the continued export of manganese to the United States in wartime.

India's leaders have often asserted her right to neutrality.

Switzerland and the low countries have heretofore adopted a neutral position. There are compelling reasons to believe that other European and Asiatic countries might adopt a similar attitude in the event of an all-out third world war between the two major nations of the earth.

THE WESTERN HEMISPHERE—WE BELONG

We belong in the Western Hemisphere.

Our ultimate security is threatened if any European or Asiatic nation moves into that area to gain military, political, or economic control.

Therefore closer cooperation between the nations of the Western Hemisphere is immediate and compelling.

THE MONROE DOCTRINE

The spirit of the 130-year-old Monroe Doctrine is the settled principle upon which that cooperation must be based.

The principle should apply equally to the British, the Dutch, the French, the U. S. S. R. and to all European and Asiatic nations.

NECESSITY FOR GOING-CONCERN PRODUCTION

The solution can best be found in a going-concern producing industry in each of the critical material fields, within the transportation areas that we can defend, and by maintaining the maximum economic production within our own borders.

The testimony of producers, engineers, and experienced operators throughout the investigation generally was to the effect that the creation and maintenance of a domestic going-concern production can be accomplished through a liberal depletion allowance on all such materials and a flexible duty or tariff on the basis of fair and reasonable competition, adjusted by Congress as directed by article I, section 8, of the Constitution.

COMMUNIST CREDO

Recent events tend to show that the Communists are following the basic tenets and creed of the Stalin-Lenin philosophy that in order for communism to be successful it must exercise universal control.

GROWTH OF COMMUNIST-DOMINATED AREAS

In the past 10 years Russia has engulfed Estonia, Latvia, Lithuania, Albania, Czechoslovakia, Poland, Hungary, Bulgaria, Rumania, Eastern Germany, Eastern Austria, and Yugoslavia. The Communist coils then reached out into the Far East and entwined China, Manchuria, Vietnam, North Korea, and Tibet. These are all now under Communist domination.

Unrest in Malaya, Indochina, and other southeastern Asian nations presage the possible further girdling of these areas within the Communist sphere. South American developments, as in Guatemala, Bolivia, and British Guiana in the very recent past and present, show alarming gains by the Communists without their resorting to force as they did in Poland, Czechoslovakia, and other areas in Europe.

The smoldering, surging, nationalistic feelings of millions of people, in the low-standard-of-living areas in Asia and Africa, have been fanned by Communist propaganda. Rebellion against colonialism, foreign ownership, and development of national resources presents serious problems if we are dependent on these sources for essential materials.

Some of these areas are peopled by persons of little education, untrained and uninformed, who make gullible and ready victims for Communist propaganda offering a Utopia which they may find only too late exchanges their present lot for one of slavery and chains.

PRESENT SOURCES OF OUR STOCKPILE

It is from Africa, Asia, South America, and other foreign areas that this nation has secured some 80.1 percent of its present stockpile of critical and strategic minerals and materials.

If ever the United States is to be vigilant, now is the time. We must recognize our greatest weakness is the dependency on very distant countries across the major oceans for the needed raw materials, without which we cannot fight a war or live in peace.

HAVE-NOT POLICY

Many witnesses stated much of our present national policy is based on the assumption that the United States is definitely a have-not nation in respect to a considerable number of vital and strategic raw materials, viz: that we have exhausted our minerals and ores.

It was alleged this assumption is one of the greatest frauds and hoaxes ever perpetrated on the American people. It has had a sinister origin and has been perpetuated by various commissions principally manned by economists, who, despite the pretense of detailed study, have failed to examine into the fundamentals.

These so-called experts, not experienced in problems of production, have had no actual production or mining experience but have relied on statistical material wrongly interpreted and consequently misleading. This aspect will be more thoroughly treated in another part of this report.

Where stated, this assumption has had a direct bearing on the conduct of our foreign policy. It has led us to underwrite the fiscal

systems and policies of various foreign states whose friendship is deemed of the greatest importance due to their possession of raw materials which we are believed to lack.

OUR WEAKNESS INVITES WAR

There is every possibility that our current dependency on foreign sources of supply may be the weak link in our defense that makes it attractive to the Russians to embark on a war on the simple score of a feasible short war. This strategic motivation could invite an effort to cut off the United States from sources of critical raw materials essential to its industrial plant, and hence hinder our ability to wage war.

DEPENDENCE FOR STRATEGIC MATERIALS HAS LED US TO GLOBAL COMMITMENTS

Strategic materials vital for our defense are now drawn from the four corners of the world. For example, we depend in a large part upon India for manganese; the Philippines for chrome; Belgian Congo for uranium; Indochina for tin and rubber, and Nigeria for columbite and cobalt.

While relying upon foreign sources for these strategic materials, we have failed to develop obvious potential resources in the United States and the Western Hemisphere. This practice has led us into a policy which compels us to underwrite their security and their present political and economic status quo. This situation requires that sea lanes to and from these areas be kept open for our sea transport in time of war.

Meanwhile, Communist powers have developed the military capability of denying these strategic materials to us both at their sources and in transit. From Communist airbases already in existence, all foreign sources of strategic materials—except those in South Africa, South America, and Australia—are within striking distance of Russia's intercontinental bombers. The Red submarine fleet, several times as strong as was Hitler's in 1941, can seriously challenge our freedom of the seas. Moreover, the Communist doctrine has politically neutralized some of these areas so that in war we may be unable to buy strategic materials from them.

Some of the experts claim our dependence upon strategic materials from such foreign lands has been used to justify unprecedented global commitments and the imposition of strategically unsound commitments and deployments of our military forces.

SURVIVAL DEPENDS ON AIRPOWER IN BEING

It must be recognized that after war starts, our former great military asset—the unmatched productivity of our industry—may be seriously endangered. World war III will be decided in the air and the initial results may determine the conflict. Only the air force which we possess, in being when the war starts, can save us and our allies from defeat by the initial atomic or hydrogen assault by Red bombers. The side which wins the battle of the air, in the initial phase of the war, can also win the final decision. Once one side wins control of the air, it can hammer its enemy from the sky until he has had enough.

Military men testified that two steps are, therefore, imperative for our survival. The first is to create the most powerful air force in the world; the second is to make the Western Hemisphere self-sufficient in strategic materials.

They state neither task is insuperable. The first task in the interests of solvency, involves paring down spending on the Army and Navy which have become supporting weapons to airpower, together with a drastic curtailment of foreign aid. Such a defense program would total less than $35 billion a year. (See pt. II, Hearings, p. 568.) The second step requires stockpiling to supplement "going concern" production in the development of Western Hemisphere critical materials. In the long run both of these steps will strengthen our security and economy.

In no way is this proposed program an abandonment of our allies. Rather, it offers them the most effective support possible for us to extend.

If world war III comes, enemy submarines and airpower could prevent the overseas supply and reinforcements for NATO forces. Moreover, the unlimited numerical strength of the Red armies will overwhelm our relatively small ground forces. In addition, the satellite wars which we are supporting are a cumulative drain on our resources and are indecisive.

It was stated that were we to create overwhelming air supremacy and maintain the Western Hemisphere as an indestructible base, the possibility of war is very remote. Russia is the base from which all Communist activities emanate and are supported. If the Kremlin leaders know that world war III means the quick destruction of their base, they may be deterred from striking.

Only by preventing world war III can our allies, especially those in Europe, be saved from a devastating war. Were war to be forced upon us, only by overwhelming air supremacy can we prevent the destruction of ourselves and our allies by enemy atomic and hydrogen bombing attacks.

OUR STRENGTH RESTS ON OUR HIGH PRODUCTIVE CAPACITY FOR WAR MATERIEL

It is recognized that for the most part our great military potential lies in our ability to mobilize our tremendous productive resources for the long pull.[1] In the end it may be assumed that we will overwhelm Soviet arms as we did those of the German-Italo-Japanese Axis, by the sheer mass weight and quality of the war materiel which will be turned out by our mills, factories, and plants.

No such present potential exists at the disposal of the Kremlin. In making its military calculations the Kremlin is forced to consider that in any test of strength, where the time factor is an element, it would ultimately lose. However, if the U. S. S. R. overruns the European Continent she could gain the production capacity which the United States helped to finance and rebuild with Economic Cooperation Administration help. The European productive capacity coupled with that of the U. S. S. R. would then equal our productive capacity.

[1] Excerpts from letter by Senator Hugh Butler dated July 21, 1953—Committee on Rules and Administration Report No. 689, 83d Cong., 1st sess.

OUR PRODUCTIVE CAPACITY DEPENDS ON ACCESS TO RAW MATERIALS AND MINERALS

Obviously this advantage accruing to our superior technology would be liquidated if our access to critical materials were limited or destroyed. By striking at the overseas transportation lines to our industrial plants the Soviet could consider that it would immeasurably enhance its ability to emerge victorious.

Such strategy no doubt would appear to be immensely more feasible and desirable to the Soviet than an attempted decision by pitched battle, or an effort to attain decision by atomic attack, which would invite retaliatory atomic attacks.

World War II provided an object lesson into the possibility of reducing an enemy by economic siege. The effect of a strictured supply of such relatively unimportant materials as kapok and quinine were strongly felt.

The effect of the loss of our rubber resources was for a while critical. Our ability to compensate for this deficiency through the use of synthetic rubber proved a factor of the greatest consequence in our conduct of the war.

It is rational, therefore, to conclude that to deprive the American productive plant of the full flow of raw materials essential to its needs, would be to place our Nation under the most desperate possible siege, eliminating at a stroke the enormous advantage we held in World Wars I and II, in which our superior technology and industrial organization provided the key factors to victory.

It was pointed out by contrast that the Soviet industrial economy is not dependent on overseas transportation since the Soviet with its present satellites is virtually self-sufficient in strategic raw materials. However, we still maintain the advantage of superior technology and industrial organization.

PROHIBITIVE COST OF MEN AND MATERIEL TO INSURE IMPORTATION OF STRATEGIC MATERIAL ACROSS THE SEAS

We can no doubt maintain our superiority at sea by throwing a preponderance of our forces into one area and even successfully convoy strategic materials from distant areas to the United States but there is no question that it would be at an almost prohibitive cost in men and materiel. In addition, there would be a tremendous military advantage in placing these men and resources to work on direct aggressive prosecution of a war.

Worthy of most urgent consideration is the difficulty of transporting these materials across hostile seas. Well-known and authoritative experts such as Gen. Albert C. Wedemeyer, Gen. Bonner Fellers, and Maj. Alexander de Seversky agree that in time of war it will be at best so costly as to make it almost prohibitive in lives and vessels to ship strategic and critical materials for war across the major oceans from Europe, the Mediterranean, Africa, Far and Near East, and Australia.

According to these authorities armed Soviet might outweighs us in every single department, with the exception of surface vessels plying the seas. Our existing Armed Forces in being are wholly insufficient to act as a deterrent to Soviet aggression. In the event

of open hostilities the first rush of a Soviet offensive is certain to carry Soviet arms victoriously over a great deal of additional or peripheral territory which in turn would enable Soviet forces to establish new airbases and submarine pens giving their airplanes and submarine forces additional striking range.

It will be remembered that during the last World War the Germans almost succeeded in severing our sea communications with our European allies and in this manner sought to bring the war to an expeditious end. The record shows that in the first year of the war (1942) merchant shipping losses due to submarines and other enemy action involved the sinking of 1,863 vessels totaling 8,332,900 gross tons.[2]

In this reference it should be noted that the Germans at no time possessed more than 150 working submarines at the most effective period of their undersea campaign. Moreover, these submarines, as dangerous as they were, possessed many deficiencies as compared to new modern types. They were compelled to surface frequently, were slow and susceptible to the techniques worked out by the British and American Navies for locating and destroying them.

The Russians are reliably said to possess a fleet of at least 350 to 400 undersea craft.[3] Many of these are of the very newest types, and have the benefit of the latest German discoveries and designs. These submarines, not yet in being when the war ended, are equipped with snorkel breathing devices which enable them to submerge for weeks at a time, and make the problem of location by our Navy hunter-killer teams acute. They are fast enough to outrun most surface carriers. Equally as important, they can fire their torpedoes well out of sonar range, adding immeasurably to their effectiveness as an attack instrument.

Again, the military leaders with whom we have consulted concede the grave possibility that our capacity to protect cargo and merchant carriers against these predatory killers in wartime leaves much open to doubt. In the last war, because of the short range of aircraft our merchant shipping was comparatively unmolested by aircraft. Today, in addition to submarines, our Navy and its convoys can be attacked by long-range enemy aircraft anywhere on the seven seas. Certainly one must accept the grim possibility that we will not be able to guarantee the safe movement of supply vessels between distant foreign ports and our own.

CHANGING CONCEPT OF WARFARE (PRESIDENT EISENHOWER'S VIEW)

These are considerations which must be applied not only to the import of strategic materials from southeast Asia but from Europe and Africa as well. We are compelled to change our concept of the wartime universe, and especially of the needs of our wartime industrial base.

President Eisenhower in a recent statement (March 18, 1954) is quoted as follows:

> New Look: Now, what do we mean? We mean this—you are not fighting with muzzleloaders in any of the services. Every single day things change in this world, and any staff or any group of leaders doing his job is reexamining the world situation, geographic and otherwise, of our country and of others, to see what it is that we now need most to insure our security and our peaceful existence.

[2] Committee hearings, pt. IV, ex. 9.
[3] Janes Fighting Ships.

You cannot possibly say that the kind of a unit and organization that I took to war or took over across the Channel in 1944 would have any usefulness today whatsoever.

For example, you will recall we landed on June 6; we got out of that narrow little beachhead on about July 25; all right.

Behind that we built up two artificial harbors and we were landing over the beaches.

What would two atomic bombs have done to the whole thing?

So you have—you just simply can't take, in warfare or in any contemplation of war or preparation for war, and take old patterns and say that is by which we live.

All that the New Look is is an attempt by intelligent people to keep abreast of the times; and if you want to call your today's clothes the New Look as compared to what Lincoln wore, all right, we are in the New Look.

Evidence before the subcommittee indicates serious national misconceptions in regard to our raw material position. Inquiries have also brought information leading to the possibility of effective corrective measures, principally related to the development of raw material self-sufficiency on the North and South American Continents. The important thing is that we need not be dependent on far distant, uncertain political areas for our strategic and critical raw materials in time of war. Our security requires that we do our utmost to obtain complete control of strategic supplies, either in production or stockpiles, within our own country where it is at all possible.

DANGER INCLUDES OUR SUPPLY LINES AND NEUTRALIZATION OF OUR SOURCES OF SUPPLY BY BOMBING

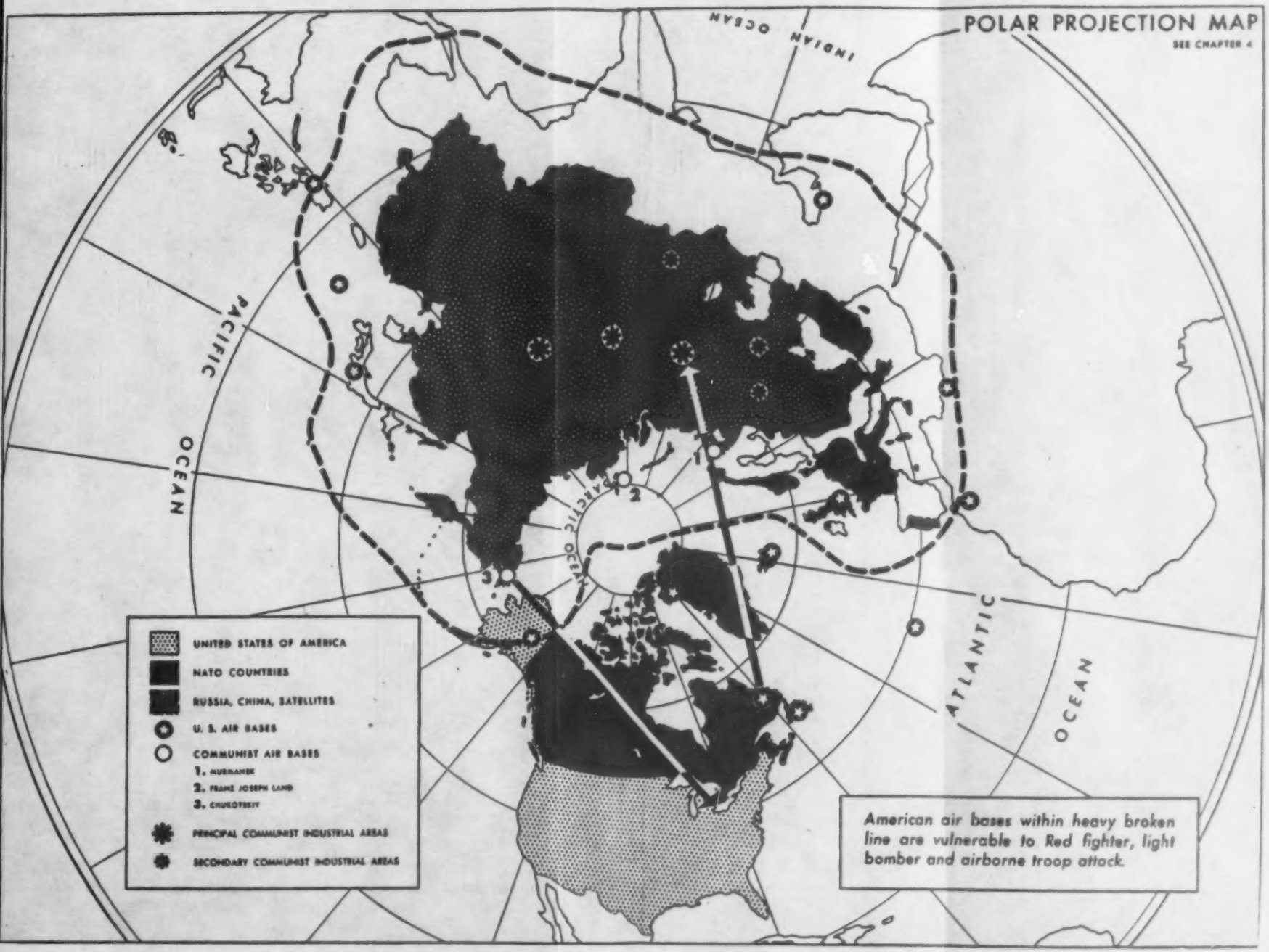
All of this bears with obvious importance upon the question of our national security and the possible strategy open to us. It is a matter which is sure to enter into enemy calculations. One of the great goals of Russian strategic operation could very well be the delivery of lightning blows at the sources of our raw materials, the mines, mills, and railroad lines, and ocean ports of Asia and Africa, in an effort to liquidate our capacity to fight a long war.

Well known strategists contend that sources for strategic materials in these areas will be denied us because they are within easy bombing range of our principal potential enemy, the U. S. S. R., and its satellites.

In the last war the enemy had no alternative but to attempt to cut our supply lines. Today he need not bother with supply lines; he can strike directly at the sources of our strategic materials within his long-range airpower and neutralize them with conventional or with atomic and hydrogen bombs.

A glance at the polar projection map shows that the Soviet from its bases in the Balkans, China and Siberia and Europe can bomb at will within a 3,000 mile range almost all of Africa, all Malaya and Indochina, India and Arabia—in fact all Asia and all Europe as well as Canada and the northern half of the United States. The only areas beyond reach of long-range Soviet bombers are the southernmost part of the United States, Mexico, Central and South America.

Our questionable ability to keep sealanes open is only one phase of the problem of the accessibility of critical materials in time of war. It would be fruitless to successfully concentrate our forces on keeping the sealanes open. We will face strangulation of supply of strategic



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materials should the enemy choose to bomb and reduce our sources for these materials to rubble.

It is apparent that almost all of the mines, mills, railroad lines, ports of export for our sources of critical materials which we get from Asia, India, and Africa are well within bombing range of the Soviet air force.

Aerial bombing is not the only method by which the enemy could destroy foreign sources of supply. The rising nationalistic feelings fanned by Communist propaganda in colonial areas are recognized in the main to be antagonistic to the Western nations. Internal sabotage, an act in which the U. S. S. R. is experienced and expert constitutes a tremendous hazard. Almost every mineral producing facility has a critical spot where sabotage could destroy production for a considerable period of time. Moreover, rail transportation and port loading facilities are particularly vulnerable to sabotage, particularly bridges, tunnels and single track railways in remote jungle areas.

DENIAL OF STRATEGIC MATERIAL DUE TO POLITICAL FACTORS

Political factors may well become the most effective roadblock to our ability to obtain critical materials. Certain areas such as India, Malaya, Africa may claim to be neutral and yet throw their support to the Soviet and embargo the export of strategic materials. This attitude may be due to either fear of retaliation by the Kremlin, or it may be from inner political attitudes which may tend to favor the Soviet rather than the United States.

Regardless of the reason it would be sensible to measure and weigh such possibility of sterilization or neutralization of our sources of critical materials.

JETS PRODUCED IN AFRICA NOT UNITED STATES—STEEL PRODUCED IN INDIA NOT UNITED STATES

Modern jet engines cannot readily be built without cobalt and columbite and no steel can be made without manganese. We import at present a very large percentage of these materials from India, Africa, Nigeria, and the Belgian Congo, from sources halfway across the globe.

Major de Seversky pungently states "our jet engines come from Nigeria (where we get our columbium), and not from Hartford; our atom bombs comes from the Belgian Congo (where we get our uranium), and not from Oak Ridge; our steel comes from India (where we get our manganese), and not Pittsburgh; our bearings for our wheels and motors from Malaya (where we get our tin for babbitt) and not from Detroit."

It is believed by some that a future atomic war will be of short duration. However, a war with the Soviets may very well be an interminable affair outlasting in terms of time any feasible stockpile program we presently visualize. It seems mandatory therefore, that steps be taken to increase the availability from both domestic and Western Hemisphere sources accessible to us in time of war of all critical materials.

This applies particularly where these materials originate in areas which cannot be strategically safeguarded by our forces and those of

our allies, or which involve long hauls of heavy tonnage such as manganese from India under conditions where safe conduct over the sea pathways cannot be guaranteed.

Many distinguished military authorities, including Gen. Carl Spaatz, Gen. Albert C. Wedemeyer, Maj. Alexander P. de Seversky, and Gen. Bonner Fellers testified before the committee at considerable length and were very precise in their conclusions on the accessibility of critical materials—in preparation for the next all-out conflict. The following statements point up their convictions.

TESTIMONY OF GEN. CARL SPAATZ

Senator MALONE. Do you believe that petroleum from the Middle East would be available to this Nation in time of an all-out war?

General SPAATZ. I think it would be very doubtful whether we would get that oil for a time after war broke out.

Senator MALONE. Then anything outside of the Western Hemisphere in the beginning including supplies from Africa, the Middle East, India, the Far East, would be problematical?

General SPAATZ. It would be problematical. Our own security should demand, it seems to me, that insofar as possible we would not allow ourselves to be fatally handicapped in case those sources were not available to us.

Senator MALONE. How would you win a Korea?

General SPAATZ. As soon as the Chinese gave concrete evidence that they were moving organized forces across the Yalu River all of the area from which those forces came should be subjected to air attack. Unless we can do that, the whole principle of having a strong retaliatory power as the basis of our defense falls flat.

Senator MALONE. Then the crux of the matter, General, is simply this: You do not want your skirmish forces in Korea unless you are able to destroy the heartland of the nation that is furnishing the push behind the war.

General SPAATZ: That is right.

* * * * * * *

Senator MALONE. And if you cannot do that you had better stay out of Korea.

General SPAATZ. That's my opinion.

THEN THE TESTIMONY TURNED TO THE INDOCHINA SITUATION AND THE WISDOM OF SENDING IN AIR FORCE TECHNICIANS TO AID THE FRENCH

Senator MALONE. Isn't the crux of the matter there that you would not dare to give them technical assistance unless you are assured of your ability to destroy the heartland of China in case China is behind the enemy?

General SPAATZ. This is correct. The situation there is somewhat like Korea before the Communists moved across the Yalu. Any indication of Chinese Communists moving organized forces into Indochina as they did across the Yalu into Korea should subject China proper to air action against their heartland.

* * * * * * *

General SPAATZ. We cannot maintain foot soldiers in sufficient strength to meet the massed action of the foot soldiers of Communist China or of Russia proper, the sole duty of this Nation is to strike by air at the heartland of the enemy.

Senator MALONE. Then, if we are unable to do that, we had better not talk big, better not move into Indochina or anywhere else unless——

General SPAATZ. Unless you are prepared to meet the situation that develops.

* * * * * * *

Senator MALONE. Unless you are prepared to go all the way?

General SPAATZ. You must think the thing through to the end and be prepared, no matter what trend it takes. The action we may take (in Indochina) may force the U. S. S. R. to come in. If so we should be prepared to meet that eventuality. All these things should be thought through before we make the initial move * * * when we move into these situations we should be prepared in every way—mentally, militarily, and economically—to fight to the end of a war with nothing but our own resources and those in our immediate vicinity.

Senator MALONE. In other words, the area that you can defend while you are doing that?

General SPAATZ. The area that you can defend you want to be as large an area as possible, but it is also possible that the area you think you are going to defend may not all be available to you as war progresses and you may be forced to your own confined area before the war is concluded.

Senator MALONE. Would that be the Western Hemisphere?

General SPAATZ. That might well be the Western Hemisphere.

STATEMENT OF GEN. A. C. WEDEMEYER

JUNE 3, 1954.

The Honorable GEORGE MALONE,
United States Senate, Senate Office Building,
Washington, D. C.

DEAR SENATOR: As you requested I am submitting herewith a synthesis of the views that I expressed before your committee on December 22, 1953, concerning the military and economic position of the United States in the event of war.

Under the current American defense concept of prompt retaliation against any nation that might attack us, our military forces would operate from bases available and in close proximity to the enemy heartland. It is not unreasonable to assume that such bases might be destroyed or in other ways denied to us. In that event we would be compelled to conduct offensive operations predominantly through the air from bases within the Western Hemisphere.

Also due to enemy action, sources of critical materials in remote areas of the world might be denied to us at least temporarily. Under those circumstances we would be required to resort to stockpiles of critical materials and the full exploitation of sources of raw materials in the Western Hemisphere in order to meet industry's increased demands in the production and maintenance of military equipment. Another important factor in connection with industry under such conditions would be the development and use of substitutes.

The United States within the collaboration of free nations in the Western Hemisphere could carry on effectively an increased military effort until a more favorable situation is created, wherein military bases in closer proximity to the enemy heartland could be established.

Likewise from the economic viewpoint we could and should utilize our ample sources of raw materials and introduce substitutes until safe communication could be reestablished to other sources. This statement, of course, is predicated on the premise that we now prepare for such contingency and maintain in operation or on an alert status, the organization and facilities for the procurement and development of raw materials. In addition sources and facilities connected with war production in contiguous areas for example in Canada and Latin American countries should be integrated in and coordinated with our plans and preparations for such emergency.

In presenting these views I definitely am not suggesting that military allies and foreign sources of raw materials should be dismissed from all consideration. In our own interest and in the interest of helping friendly nations we should continue to integrate and coordinate our combined efforts both militarily and economically in the event of war.

Finally realism demands that the United States be prepared at all times for the worst contingency which, of course, would be that the initial operations of the enemy may compel us to operate militarily from the Western Hemisphere and to resort to our own sources of raw material and industrial facilities. Sound strategy therefore dictates that appropriate plans and preparations be made now to make this possible.

I hope sincerely that the ideas above expressed will make some contribution to the splendid efforts of your committee to focus the attention of responsible officials and the American people in general to the dire necessity of stockpiling strategic materials and of developing sources readily available either in the United States or in contiguous areas.

Faithfully,

A. C. WEDEMEYER.

STATEMENT OF MAJ. ALEXANDER P. DE SEVERSKY

THIS MAP CAN SAVE AMERICA!

(By Maj. Alexander P. de Seversky, author of Victory Through Air Power)

Our most provocative air expert tells how the new superbombers are revolutionizing warfare and what we must do before it's too late

With the danger of another world war grimly real, the American people today are deeply concerned about military preparedness. But one critical element in the security equation has not received sufficient attention. It may prove to be the weakest link in our chain of defense.

I refer to vital strategic materials indispensable to our survival.

When Japan sealed off our normal supplies of crude rubber and other key materials in the last war, it struck a body blow at American industry. That will seem a minor disaster compared to the industrial starvation which will be imposed upon us in any new war—unless we recognize the danger in time.

That danger derives from revolutionary changes in warmaking which, unhappily, have not yet been fully grasped. The most crucial fact to which we must adjust our minds, and the sooner the better, is this:

From now on, transoceanic, interhemispheric air warfare is not only possible but inevitable.

It is a fact which torpedoes many established ideas on national defense, war production, and the future roles of armies and navies. It is bound to be resisted by some military thinkers whose minds are hobbled by tradition and service loyalties. But it is a fact to which we must gear our planning if the United States is to remain safe in a turbulent world.

Let's look for a moment at some recent developments which underlie all future plans for the security of the United States.

In the last war the biggest weapon of our Strategic Air Force was the B–29 long-range heavy bomber. Today the B–29 is already officially considered only a medium-range bomber. Though its striking radius of 2,000 miles is still impressive, we now have in the air and in production the B–36, which, with current improvements, will have a 13,000-mile flying range. This means a 5,000-mile striking radius for a fully loaded bomber. On December 7 and 8, the United States had a dramatic preview of things to come when a B–36 flew nonstop from Texas to Hawaii and back—a total distance of over 8,000 miles, with a full military load (bombs, crew, and equipment required for a combat mission).

THEY'LL STRIKE ANYWHERE

The B–36 is an example of the long-range strategic airpower which will revolutionize our ideas of military strategy. Such planes can rise from our own continent. Then, without need for overseas bases, they can strike at almost any point in the anatomy of a European or Asiatic enemy—and return home.

We do not know whether Russia has such aircraft today. But common sense demands that we assume the development of such air power by potential enemies. Even if a war should begin on a 2,000-mile basis, it will inevitably be transformed into a 5,000-mile contest before a decision is scored. Such comparable extension of range took place during World War I and World War II—and we have no reason to doubt that it will happen again.

Now let's see what this new concept of 5,000-mile air warfare does to our designs for national defense and military strategy. The map on the opposite page gives you a bird's-eye view of the situation.

Our conventional ideas of geography were formed on the basis of the old surface methods of transportation. In the aviation era they have lost most of their meaning for peacetime and all meaning in time of war. Distance and space relations, measured both in time and direction of flight, are completely different.

RUSSIA'S BACKYARD

Once, we thought of the Orient as located to the west of us, with Europe to the east. But in the aerial age we are getting used to looking down on our planet from the North Pole. Thus viewed, the continents which seemed east and west of us, we discover, really lie to the north. On this new map, Europe and Siberia lie between us and Africa, the Sudan, India, Indochina, the East Indies, and northern Australia. In hostile hands, the European-Siberian land

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mass constitutes for us a barrier to the regions beyond, effectively blocking our access to them.

In aerial terms, the places I have just mentioned are closed to the United States. They have become a sort of backyard of Soviet Russia, the dominant airpower nation of the Eurasian continent.

By the same token, however, South America is our aerial backyard, safely outside the aviation reach of Russia. Our North American land mass stands as a barrier between Eurasia and Latin America. Shipping between North and South America is coastwise, generally beyond the striking range of the Soviet Air Force. It will move under airpower firmly anchored on the American shoreline.

The map reproduced here represents graphically this new power relation between the American and Eurasian continents if they clash in war—given the inevitable striking range of 5,000 miles.

The "reach" of North America is fixed by its four extremities—Alaska, Newfoundland, California, and Florida—in an approximate square. The portion of the globe dominated by an American Air Force of 5,000-mile radius operating from these outposts forms a vast circle (shown in lined portion). Theoretically, an *American Air Force of such range could destroy any target in this area.*

The Eurasian continent, bounded by such points as Murmansk, the Caucasus, Kamchatka and Bailkal, is somewhat oval. The area covered by an equivalent Soviet Air Force operating from the outer edges can be represented by an ellipse (shown in dotted portion). In like manner, the Soviet Air Force could destroy every target in this area. And should the present Communist advance in China engulf the whole country, *Russia would not have to wait for 5,000-mile bombers to exclude us from its backyard in Asia.* It can do so with its copies of our B–29's already on hand.

Where the American circle and the Russian ellipse overlap (the center portion) will be the aerial no-man's land. There the contest for mastery of the whole air ocean will be unfolded. It is the area within airpower of both nations, and encloses the industrial vitals of both belligerents.

That will be the combat area, the area of decision. Here the offensive potential of each nation will confront the well-deployed and well-supplied defensive air force, the antiaircraft, ground-to-air missiles and the rest of the defensive potential of the opposing nation.

NO ADVANCE POSTS

In the past a belligerent could establish local control of the sky over some distant spot for use either as a military advance post or as a source of strategic supplies. We maintained such patches of isolated control in the last war in China, Burma, Iran, Iraq, and other points—just as the British Empire, in the days of seapower, maintained isolated naval bases. *But in the future local dominance of this type will no longer be possible.*

In the next war, a detached point inside the enemy's orbit of bombardment will not be able to survive unless it is endowed with air defenses of a magnitude to challenge the enemy's entire striking air force. To hold a series of isolated points, that is to say, we would need a series of air forces, each of them big and strong enough to defeat the foe's total striking aerial strength. Clearly this would be an economic impossibility. Thus everything in the dotted sector, which is Russia's backyard, would be lost to us—just as surely as everything in the lined segment would be denied to Russia.

As this central fact becomes understood, it will bring explosive upsets in all our established military concepts. *The triphibious land-sea-air team devised in World War II to carry short-range aviation within striking distance of the enemy will be a thing of the past.* Airpower of global range will attack industrial vitals directly and at once, operating from continental home bases.

But the emergency of such interhemispheric warfare will affect not only military strategy. It will affect profoundly every aspect of our national life—our industrial setup, allocation of materials, deployment of manpower, nearly everything. The most important effect will be on the sources of supply of critical materials essential to the conduct of modern war.

The United States, for all its amazing natural riches, is still, in many respects a have-not Nation. It depends on the outside world for a long array of strategic materials, from crude rubber and additional oil to tungsten, cobalt, manganese, etc.

To illustrate, the future Air Force will be jet-powered. Cobalt today is the key material in the manufacture of gas turbines. Yet 75 percent of our cobalt

requirements must be imported. The same is true of chrome, so vital for high-grade steel-alloy production. Only 15 percent of the needed amount is found in the United States. The situation is just as acute with tungsten, manganese, and other materials without which a war machine cannot function. All of these can be found and developed in South America.

Unless we make certain that we shall enjoy a continuous flow of these products in time of war, we may find ourselves dangerously, if not fatally, handicapped.

We have only to recall our plight at the start of the last war to realize the seriousness of the problem. Our leaders had counted smugly on rubber, hemp, a hundred other indispensable items from the East Indies, the Philippines, Indochina. Smugness gave way to alarm and near despair as Japanese aviation closed one Pacific door after another to us.

THE AIRPOWER AGE

Are we heading for another such disillusionment—on a far bigger scale? I am convinced we are—unless we wake up to the realities of the airpower age. *Again we are basing strategic and industrial plans on materials that will be denied to us by hostile aviation.*

Consider a concrete example. It is no secret that a great deal of diplomatic and military effort has been centered in recent years on the Near East. Strategic blueprints are geared to the assumption that Arabian oil will be available to us. But those oilfields are practically on the border of the Soviet Union. They are within easy striking reach not only of Stalin's strategic bombers but of his short-range dive bombers and fighters as well.

Within hours after the start of hostilities, we may be sure, the Arabian oilfields will be subjected to devastating air attack by the Soviets. Our chances of holding them will be no better than would be Russia's chances of defending oilfields in the American orbit, let us say in Mexico.

AERIAL DESTRUCTION

What is true of the Near East is no less true of every other region within range of the Soviet Air Force. What Russia cannot or does not need to capture for its own use, it can deny us by destruction from the air. *To place any reliance on supplies from such regions is to stake our victory on self-delusion.*

Such is the picture. It leaves us no reasonable alternative to the intensive development of sources of *strategic supplies in our Western Hemisphere.* Research on substitute materials must be stepped up. Those that have no substitutes must be stockpiled without delay.

Our planning must discount oil from the Near East, rubber and tungsten from China and the East Indies, all other vital supplies heretofore provided by areas in the dotted zone of our map. A premium should be put on weapons forged out of materials located in our own hemisphere.

The common defense of our hemisphere by all the nations of the Americas is no longer merely a desirable objective. Under the conditions of tomorrow's global aerial range it becomes a dire necessity. South America cannot survive without the kind of defenses that only industrial United States of America can generate. The United States, in turn, cannot fight a modern war successfully without the natural resources of South America, actual and latent.

The Eurasian continent is naturally self-contained. To blockade it by air or sea is a futile gesture, since it does not have to rely on outside sources of supply. Unfortunately the Americas, in spite of their great abundance and diversity of natural resources, are not yet completely self-contained. *Our immediate goal in the sphere of economic warfare must be to make them so.*

WATCH THE FARMS

A systematic appraisal and reorganization of the economic potentials of North and South America should be made. An Inter-American Resources Planning Board should be set up at once, embracing agricultural as well as industrial potentials in its scope.

Though we still think of farming as related only to food supplies, it is also a vital industrial source. A great many of the products of the soil and of livestock are important, since, through chemistry and other industrial processes, they provide essential materials for modern weapons. We cannot escape a far-reaching revision of our farming and related industries in line with South Ameri-

can productive capacity. We must look to South America, and especially to Argentina, to provide the cattle, leather, and farm products that will be drained off in the United States for indispensable war purposes.

MILITARY PLANNING

Along with orderly *economic planning on a hemispheric scale, we must, of course, have military planning to match.* Our fighter aircraft, ground-to-air guided missiles, rockets, antiaircraft artillery, radar network—the whole elaborate system of air defense—must be extended throughout the Americas.

The production of such defensive means, moreover, should be spread throughout the hemisphere. Only thus can we avoid clogging and overburdening all transport within the Americas when the test of war is upon us. The manufacture of fighter planes, guided missiles, and other defenses must be encouraged. Where necessary, Latin American manufacturing must be subsidized.

Because airlift methods will inevitably grow as a substitute for surface transportation, Latin American airlines must be built up. They should be helped to develop self-sustained operation by setting up depots, repair shops, maintenance units, as well as plants for the production of cargo planes and their spare parts.

THE BELT CONCEPT

In the next war, as I see it, the American hemisphere will be strategically divided roughly into three belts:

The first, including primarily Alaska, Canada, and Newfoundland, will be the deployment belt, from which our long-range striking Air Force will carry war to the heart of the enemy.

The second, the United States proper, will become essentially the industrial belt, producing the means for waging war. It will be a primary target of enemy attack—and this requires the most concentrated defenses.

The third zone, all of Central and South America, will become the supply belt, the vital reservoir of food and strategic materials. *This is the "safe" area, shut off from enemy attack.* It must be developed to support the effort in the other two zones.

Functions of the three zones will of necessity overlap. But the three-belt concept is useful as a guide to our overall thinking and planning.

These are inescapable facts. *Victory will be possible only if the Americas become just as self-contained as a Russian-dominated Eurasia.* The time to begin to achieve that economic independence is now. It is a challenge to American statesmanship, industry, and economic good sense.

STATEMENT BY BONNER FELLERS, BRIGADIER GENERAL, UNITED STATES ARMY (RETIRED), OUTLINING A PROGRAM FOR SOUND NATIONAL DEFENSE

In this study the defense concept recently announced by Secretary of State Dulles has been followed. That concept is overwhelming air supremacy of such magnitude that it would constitute the greatest possible war deterrent. On the other hand should war be forced upon us, the striking power provided in the following estimate would be sufficient to sustain losses if our enemy strikes first, and also for a sustained atomic bombing attack—massive retaliation—by deep penetration of the enemy heart land. The striking force is considered adequate to punish our potential enemy until his war effort has been neutralized.

The cost of creating and maintaining such an American air force during the 5-year period, fiscal year 1956–60, is calculated to total $97 billion, or an average annual outlay slightly less than $20 billion.

Since the new Dulles concept for defense seemingly does not envision major ground combat by American forces on the mainland of Europe or Asia, *ground forces properly should consist of a small professional, highly mobile, airborne strategic reserve.* For the most part this reserve should be held in the United States. In the air estimate attached, provision is made for 15 wings of troop carriers. This is a total of 720 planes capable of lifting 2 divisions.

If major ground combat overseas for our Army is not contemplated, the task of the Navy is enormously lightened.

Therefore, the annual allocation of both the *Army and the Navy for the period 1956–60 is placed at $10 billion.* This is consistent with the budget made available for both the Army and the Navy during the period 1949–51 just prior to the Korean war. This amount is sufficient for the Army to create and maintain a thoroughly professional, airborne force of 8 or 10 divisions. The allo-

cation should enable the Navy, which is already in being, to perform its normal role of keeping the sealanes open and to develop the necessary techniques to meet the submarine menace.

For research and development of weapons an annual expenditure of $3 billion has been included.

As may be seen from attached chart I the combat strength, excluding troop carriers, of the United States Air Force is at present only 89 wings with some 5,000 aircraft. This is exactly one-fifth of the combat strength of the Communist air forces. We have only 2,025 fighter interceptors of which more than one-half are stationed outside the United States. (Russia has more than 3,000 fighter interceptors, while England has 1,000 fighter interceptors to defend their respective air bases and industry.)

Our best heavy bomber is the B–52 but it is not yet in production. Heavy and medium bombers available now capable of striking Russia are all obsolescent piston-driven except a few hundred B–47's.

The cold facts are our air position is most unenviable, yet we dare not permit the Communist powers to add air ascendancy to their overwhelming ground and submarine strengths. Chart I indicates an air-expansion program of 174 combat wings by 1960. It includes 4,950 modern jet-fighter interceptors, which provide a reasonable continental defense. It provides 1,950 new B–52 heavy bombers and 675 medium B–47 bombers. This terrific striking force would provide a sustained air effort against Russian airbases and war industry until they are destroyed. With proper airbase dispersion it should be strong enough to withstand estimated losses in a surprise attack by Communist bombers.

The most important role of this striking force, however, is its deterrent power. Russia is the base from which all Communistic activities emanate. If this base is lost, the program for world communization would collapse. Russia will not knowingly take any action which would lead to destruction of this base. The heavy-bomber force provided in this estimate is sufficient to destroy Russia as a base and it would be the best possible war deterrent.

Chart II shows an estimated *total* defense cost for the fiscal years 1956–61 inclusive. The average total cost of national defense during the expansion years is $33 billion. For the fiscal year 1961 the air expansion program would have been completed and our total defense outlay stabilized at a cost of operation, maintenance, and replacement of $34 billion annually.

Attention is invited to the fact that this proposed program would provide far greater defense than our postwar program of today at a saving of from 15 to 20 billion dollars annually.

The estimate includes no foreign aid. Our European allies now enjoy economic recovery. If we provide sea and air supremacy, our allies should be willing to maintain such ground forces as they themselves feel consistent with their economic capabilities.

Europe can only be saved if war is avoided. Once war starts Europe can be overrun by the Red army and Europe can also be destroyed by bombing. Moreover, until the Red submarine and Red air force menace is eliminated, Europe cannot be supplied or reinforced from the United States. Europe's best chance for survival lies in the deterrent power of our strategic bombers. We can give her no better protection.

CHART I.—*Present and proposed Air Force strength*

Wings	Number	Present combat plane total	Modern wings carried into new program	Proposed wing increase by fiscal year 1960	Total wings for new 1960 program	Plane total for 1960 program	Increased cost after fiscal year 1955 in millions of dollars
Fighter interceptors	27	2,025	10	56	66	4,950	$1,650
Escort fighters	5	375	5	0	5	375	----------
Tactical reconnaissance	4	300	4	0	4	300	----------
Fighter bomber	13	795	13	0	13	975	----------
Light bomber	6	288	6	0	6	288	----------
Medium bomber	20	900	4	11	15	675	900
Heavy bomber	14	420	0	65	65	1,950	11,700
Troop carriers [1]	11	528	11	4	15	720	64
Total	100	5,631	53	136	189	10,232	[2] 14,404

[1] Troop carriers are not included as combat planes in preceding statement.
[2] Estimated cost of annual expansion for 5-year program, $3 billion.

CHART II.—*Estimates of total defense costs in billions of dollars for fiscal years 1956 to 1961, inclusive*

Fiscal year	Wing strength	Cost maintenance	Cost expansion	Total	Army, Navy	Research and development	Total defense
1956	120	$13	$3	$16	$10	$3	$29
1957	137	15	3	18	10	3	31
1958	155	17	3	20	10	3	33
1959	175	19	3	22	10	3	35
1960	194	21	3	24	10	3	[1] 37
1961	194	21	(2)	21	10	3	[1] 34

[1] Average defense cost for fiscal years 1956 to 1960, inclusive, $33 billion.
[2] Annual cost of defense—operation, maintenance, development, and replacement after Air Force expansion program is completed.
[3] Air Force expansion completed.

MINERAL POLICY—NATIONAL DEFENSE—DOMESTIC ECONOMY

In the course of the committee's study of the Nation's mineral policy the attention of Government officials and Cabinet officers who appeared before the committee was directed to the urgent need for revamping our mineral policy from both national defense and a domestic economy point of view.

Shortly thereafter President Eisenhower appointed the President's Minerals Policy Committee on October 26, 1953, consisting of the Secretaries of Interior, State, Commerce, and the Director of the Office of Defense Mobilization.

The members of the Senate Minerals, Materials, and Fuels Economic Subcommittee were gratified at the prompt recognition by the President and his Committee for the need of a new vitalized mineral policy and the need of reevaluating our long-term mineral-stockpile objectives.

President Eisenhower on March 26, 1954, issued a statement which is quoted in part:

> The President today authorized the Office of Defense Mobilization to establish immediately new "long-term" mineral stockpile objectives * * *.
>
> The action was based on a preliminary study submitted last Friday by the President's Minerals Policy Committee, which was unanimously endorsed by the Cabinet. The complete report of the President's Committee will be submitted to the Cabinet at an early date with recommendations for a long-range program designed to strengthen the domestic mineral industry.
>
> It is estimated that the new program will result in additional Government acquisitions of from 35 to 40 metals and minerals to be purchased, wherever possible, from domestic producers, and to be spread out over a considerable period of time. In acquiring the additional amounts to be purchased under the new program, preference will be given to newly mined metals and minerals of domestic origin.
>
> The following considerations will enter into the development of the new long-term stockpile objectives:
>
> 1. It will be assumed, for the purpose of calculating long-term stockpile objectives, that, in the event of war, supplies will not be available from foreign sources except in the case of that limited group of countries to which wartime access can be had with the same degree of reliance as afforded by sources within our country.
>
> It is recognized that, at such a time, some of these foreign sources of supply will be available to the United States. It is impossible, however, to predict with accuracy just what areas will be accessible for obtaining large quantities of strategic and critical materials. Under the circumstances, therefore, the Government has decided to follow a policy which, when consummated, will mean that

the risk of strategic and critical metals and minerals becoming a bottleneck will be virtually eliminated.

2. It will be assumed that in the event of an emergency some supplies from domestic sources may not be available, in view of the fact that the Soviets now have the capability of attack on the United States.

3. Wherever possible strategic and critical metals and minerals in the stockpile will be upgraded and refined to the point at which they will be more readily usable in the event of an emergency.

Policies now in effect covering speedy acquisition of metals and minerals to meet the present minimum stockpile objectives will be continued.

Acquisition of metals and minerals to meet the difference between the present minimum and new long-term objectives will take place ordinarily at such times as the Government decides that purchases will help to reactivate productive capacity and in other ways to alleviate distressed conditions in connection with domestic mineral industries that are an important element of the Nation's mobilization base.

This means that the Government will be acquiring metals and minerals for the stockpile over and above its minimum needs at times when it will be advantageous to do so rather than waiting until emergency conditions force it to pay premium prices. Such a policy will make it possible to make steady progress toward the goal of eliminating the possibility of metals and minerals becoming a bottleneck in the event of general mobilization.

OUR DEPENDABLE SUPPLY OF STRATEGIC MATERIALS LIES IN THE WESTERN HEMISPHERE

The testimony is clear from military experts [4] as well as from the testimony of Brig. Gen. Alfred H. Johnson (USAF) Staff Director, Petroleum Logistics Division, Office of the Assistant Secretary of Defense for Supply and Logistics that our dependable source of supply of strategic and critical materials outside the borders of our Nation would be the Western Hemisphere, since this is the area that can certainly be defended.

The expanded range of airpower makes clear the danger of chaining our war machine exclusively to sources of strategic and critical minerals and materials located in the Eastern Hemisphere, in Europe, Africa, or Asia; and makes it mandatory that "going-concern" production sources be developed in South America, in the Western Hemisphere, our own backyard, which is not only beyond the reach of the potential enemies' airpower but also whose coastal sealanes, comparatively close to land bases, can be effectively shielded by United States air strength together with guided missiles, sub hunter, and killer teams. In the last analysis land transportation can be improved.

WE CAN BECOME SELF-SUFFICIENT IN CRITICAL MATERIALS

Investigation and hearings disclose that under conditions of proper encouragement and development we can become self-sufficient in the production of the critical minerals and materials in this hemisphere in sufficient quantity and quality for emergency use considering substitutes and replacements.

We have had testimony from the best informed experts in this country on our resources of strategic and critical raw materials. These experts were drawn from the Bureau of Mines of the Department of the Interior, Department of Agriculture, Department of Defense, Atomic Energy Commission and other Government agen-

[4] Hearings, pt. II: General Wedemeyer, p. 518; General Fellers, p. 537; Major de Seversky, p. 573.

cies, as well as experts of the mining and related industries, who have made their lifework the study of such resources.

These experts explode the have-not theories and they prove that this country can materially increase its economic production—often double, treble, or quadruple its supplies of critical materials; and that the Western Hemisphere can become self-sufficient. Their testimony is contained in parts I, II, III, V, and VI of our hearings. Each of the 77 strategic and critical materials has been separately studied and evaluated as to availability to the United States in the Western Hemisphere. More detailed discussion will follow in this report.

TWO APPROACHES TO DEFEAT THE UNITED STATES—POLITICAL AND ECONOMIC

The opinion has been expressed that the Soviet Government has encouraged two approaches to defeat our Nation. One is political, which is being investigated by several committees in the Senate and the House starting through the recognition of Communist Russia, without any safeguards, at all, in 1933. The second is the economic approach, starting with the passage of the 1934 Trade Agreements Act.

The committee studied the stockpile program of the Government very carefully, including its historical background, sources, prices paid for the materials and its present status.

Security reasons prevent publishing much of the material. It suffices to say that the findings relative to the status of the stockpile were in the main not satisfactory in many of the critical items.

Eighty and one-tenth percent of the present stockpile inventory was secured from foreign sources largely at the expense of domestic producers.

This policy of saving our domestic resources and becoming dependent upon foreign materials evidently emanated from, and is carried on through, the lower echelons of the State and other departments who have controlled our foreign trade policies.

It was also found that generally foreign low-wage area producers were paid as much and often more per unit for such critical materials than was paid or offered domestic producers paying several times these wages and taxes.

HARRY DEXTER WHITE WAS FATHER OF ERRONEOUS AND FALSE HAVE-NOT CONCEPT

Evidence submitted to the committee from the files of one of the libraries of Princeton University indicates that known subversive elements in the Government such as Harry Dexter White, who held high places in the Treasury Department and other agencies, assisted in establishing the false and erroneous theory that the United States is a have-not nation and that our ore bodies are being completely depleted. (See appendix IV, p. 370.)

It was evidently their plan and project to make the United States dependent upon foreign sources of supply, which in time of war would be unavailable to us and leave us vulnerable and defenseless.

Their objective, under the guise of conservation, was to dry up our domestic production, close our mines and mills and make us dependent on far-off foreign nations for our critical materials in time of war.

Informed experts, mining engineers, stated it would take closed-down domestic raw material sources—the mines, mills, and smelters—3 to 5 years to come into production and by that time a war may well be lost.

These subversive elements have succeeded in planting in the minds of most of the people of the United States, through widespread publicity, and with the aid and assistance of well-meaning and ill-informed persons, the philosophy that our national resources are being exhausted, that we must obtain our strategic materials from across the oceans, and that we must aid and assist foreign exploration and expansion of the production of raw materials abroad. They also sold the idea that as a conservation measure, we should discourage domestic exploration and production for new ore bodies and sources of strategic and critical materials according to the testimony.

INEXPERIENCED STATE DEPARTMENT OFFICIALS HAVE LIFE AND DEATH POWER OVER DOMESTIC INDUSTRY

Many witnesses claimed the State Department to which the responsibility to formulate trade agreements was assigned, has had a life and death power over our domestic mining and critical materials industry for two decades.

This power is exercised by a group of little known persons of the second and third echelon in the State Department who really formulate our foreign policy and who for the most part have served under three Presidents. Practically none of these persons has had any experience in the mining industry or in the production of strategic raw materials or in fact any business experience.

They deal in theory and not in facts. They argue from statistics and not from knowledge. Through education, environment and background they are trained to placate foreign powers and try to build up friendship with foreign powers. They hope to accomplish this by entering into trade agreements with foreign powers, giving them benefits and advantages through division of our markets, encouraging these powers to build up their production of strategic and critical raw materials which work to a disadvantage and at the expense and destruction of our domestic industries and thus weaken the security of the Nation.

Their "equality of sacrifice concept" has led to an almost complete closing of hundreds of our small lead and zinc mines, and almost complete closing of our mercury and antimony mines, and is leading rapidly to the closing down of our fluorspar mines and more recently is seriously affecting the output of our copper mines.

SPECIAL DEVELOPMENT LEGISLATION

Had it not been for a recent act of Congress under Public Law 206 the exploration and development of several other minerals would have terminated 2 years earlier, namely, tungsten, manganese, chromite, asbestos, mica, columbite-tantalite and beryl. It seems to be impossible for our theorists to learn that a mine cannot be turned on and

off like a spigot. The mines of this country have been turned off after World Wars I and II and reopened when emergencies arose at very great cost to the taxpayers and with loss of valuable time. Witnesses have stated that it is imperative that in order to create a healthy "going concern" mining industry in this country that this power be taken away from these uninformed men in the State Department and placed in the hands of men who have an intimate knowledge of our strategic and critical raw material needs, resources and ability to produce. Until this is done, this Nation will remain in a state of peril.

TRADE AGREEMENTS ACT OF 1934

The State Department policies emanated from the 1934 Trade Agreements Act whereby Congress transferred its responsibility to adjust the duties, imposts, and excises, commonly known as tariffs, to the executive department. Witnesses testified that unless these powers revert to Congress there is little or no hope that the strategic and critical materials industries in the United States producing the forementioned 77 critical items as well as other items of equal importance such as coal and petroleum can hope to regain a healthy and productive status.

It is equally important that relief be extended to the producers of strategic materials from the burdens of taxation which because of the peculiar nature of the mining industry, places them in a different category than other industries.

It is little realized that the competition from such materials produced by low-cost labor imported into this country with no compensating duty or tariff to make up the difference in wages and taxes discourages the investment of private capital in such industries.

These imported materials are often produced in sweat-shop labor areas where little or no taxes are paid, therefore, they have the double advantage of coming into this country with low labor cost and low tax cost in competition with our domestic mining industry which operates under a high tax and a high labor rate.

PROBLEMS INVOLVED IN ASSURING ACCESS TO STRATEGIC MATERIALS

The question of guaranteed access to materials known to be on the critical list is not a simple but a complex one. Under today's conditions many factors must be equated, including the political attitudes of the supplying country in time of hostilities with our potential enemy, the defensibility of the supplying areas under wartime conditions, and our ability to protect the supply routes by which delivery would be made to our ports of entry.

HEMISPHERIC SOLIDARITY

Some of the witnesses stated we must assume a more realistic and practical attitude toward South America. "Hemispheric solidarity," the backbone of our common defense, must become more than a slogan.

It was alleged that preoccupation with our allies across major oceans and the seeming neglect of the needs of our own hemisphere, the United States has been largely regarded with suspicion and animosity by our neighbors to the south.

It is necessary to consider the problem in terms of hostile as well as peacetime conditions. We must also consider the position as it would exist if we were forced back directly to the defense of our own hemisphere. The situation then would involve a time factor, how long would it take to get production of strategic material underway, how long to do the exploration, investigation and training of personnel, and to supply necessary investment.

PROTECTION OF AMERICAN WORKERS AND INVESTORS

Consideration must be given to the economic factors under which such mining operations as lead, zinc, copper, mercury, and tungsten are now forced to compete with the imports of foreign producers of these materials, and the effect on the ability of American mine operations to survive. Thus comparative working conditions and standards of living the world over are of direct security interest within the scope of this investigation. The protection of our workingmen and investors equal to the differential in the wages and taxes here and abroad becomes an important factor.

At a moment when the United States is using the greatest amount of lead and zinc in its history, our lead and zinc mines are closing down, unable to meet in our own domestic market the competition provided by foreign competitors. This raises the serious question of the time factor required and the cost to reopen these mines if necessity arose. In many cases the mines would be flooded; engineers, skilled miners, and operators would have to be found, organized and financed. It is conceivable that the effort to reopen these mines for effective full-scale operation might require from 3 to 6 years.

An example in another direction is mercury, in which we are said to be singularly deficient and on which we rely principally on Spain and Italy for our sources of supply.

There is plenty of mercury on this continent. When World War II ended the price was reduced to $80 per flask through European competition and when our own producers were forced out the price climbed to $270 per flask.

A duty or tariff equaling the difference in wages and taxes between this Nation and the European source would reopen our mines. Attention may be called to many other materials, such as manganese. We now secure one-half of our annual supply from India which would be unavilable in wartime.

Manganese is 900,000 tons in plentiful supply in Brazil, though here again a time factor is involved, demanding the construction of roads, railroads, and mining plants, creating a strangling problem of delays under the high pressure bottleneck conditions which might apply in wartime. Our own production of manganese can be doubled or trebled, a duty adjusted on a basis of fair and reasonable competition.

POLITICAL FACTORS OF SOURCE NATIONS

In addition there must be considered the political conditions which might apply to the countries in the Western Hemisphere which create an unfavorable climate for quick availability of needed raw material

resources in wartime. Illustrations here might be (1) Chile where after much wrangling over the price demanded for copper an agreement was reached in March 1954 to purchase 100,000 tons of copper at 30 cents a pound; (2) Bolivia where nationalization of the mines and deep suspicion of the United States do not offer favorable conditions for the time necessary for swift replacement of our tin supplies should Malaya and Indochina be cut off.

There is a tendency to assume somehow that peacetime access confers a guaranty of continued availability even under the special conditions created by war.

Our experience in the last war, especially after the Japanese invasion of the South Pacific, teaches us how dangerous and fallacious such an assumption might be. Yet it is on exactly such an assumption that the present critical material policy of the United States is largely based. It is this concept which provides much of the reason for our continued support of the fiscal and strategic positions of certain foreign nations, instead of in more direct terms of American interest.

The existence of tungsten in Korea, for example, is assumed to be an important factor in our determination to hold the southern end of that peninsula. Similarly our relations with the Belgians are judged of vital moment, due to Belgian possession of uranium sources in the African Congo. There is plenty of tungsten in this nation for our peacetime and emergency needs, but the difference in the wage standard of living here and abroad is too great for competition.

Given an equal tax break there is every indication that there is more than sufficient uranium and other fissionable material on this continent to supply all of our possible needs for many generations to come.

In tungsten, a critical mineral of the greatest importance, the imports from foreign sweatshop labor countries drove practically all of the American mines out of business because of their low cost labor production with which United States mines could not compete. Only special legislation fixing the price of this indispensable critical material until 1958 has continued the domestic mines in operation. No fixed price is necessary if a duty or tariff equaling the difference in wages and taxes is made effective.

Such a duty or tariff would enable the domestic miners to engage in exploration, development, and production of tungsten which has made us self-sufficient for peacetime purposes and no doubt can enable us to step up production and meet wartime defense demands.

It is the view of some witnesses that is imperative and vital to the secutiry and to the economic structure of this Nation that foreign trade be again established on the basis of fair and reasonable competition and that the spirit of the Monroe Doctrine be revitalized for the Western Hemisphere.

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MINERAL AND MATERIAL SECURITY FOR THE UNITED STATES AND THE WESTERN HEMISPHERE

The bulwark of security for the Western Hemisphere is the great industrial power of the United States. To make this protection effective, it is imperative that realistic measures be taken to assure at all times an adequate supply of critical and strategic minerals and other raw materials to keep the industrial machine working at full capacity. This can be accomplished by a policy supporting the maximum economic production in the United States, and complete self-sufficiency within the Western Hemisphere.

ECONOMIC PRODUCTION

Difference in cost of production is the difference in wages, taxes, etc., between this country and the chief competitive nations.

Present knowledge of resources indicates that the Western Hemisphere could attain complete self-sufficiency. Industrial diamond is the only mineral that might have to be stockpiled from outside the Western Hemisphere. Use of this material can be reduced one-half through other methods of grinding and through substitute materials—and there is every probability that a substantial amount of this product can be obtained from Brazil.

MINERAL SUPPLY BASIC TO SECURITY

The United States owes its preeminent position as an industrial and military power primarily to its mineral resources. The great coal and iron-ore deposits of this country provide the foundation on which our gigantic iron and steel industry has been built.

Our enormous petroleum resources have made us the world's leading producer and consumer of petroleum products. Huge metalliferous resources have made it possible to establish the vast manufacturing industries that have developed in the periphery of our steel-producing centers.

Without these mineral resources, the United States could not have attained its industrial stature, which has made it possible to reach and maintain our high standard of living and military might, the basic essentials of our national well-being. In considering the problem of mineral supply, therefore, we must constantly keep in mind that we are dealing with essentials of peace and war without which our national peacetime and wartime security would be at the mercy of the outside world.

WHAT IS OUR PROBLEM IN MINERAL SUPPLY—PROFIT INCENTIVE

During the past 2 decades our mineral-supply problem has been complicated by the fact that imports of copper, lead, and zinc have been contributing a substantial proportion of our total needs, in contrast to a former position of self-sufficiency.

Imports of petroleum are beginning to loom large in our domestic market, whereas a few years ago we were a substantial net exporter of crude petroleum and petroleum products. Thus, a major factor in our raw-material problem is the threat to our security that results from our deliberate dependence on foreign sources of supply over which we have no control.

Industry expects that another phase of the problem is the destruction of incentives for private capital to risk the great hazards involved in the search for and development of mineral supplies. High taxation, unwarranted restrictions on the raising of venture capital for mineral exploration, and the virtual destruction of protective tariffs under the Trade Agreements Act are the principal contributors to this condition.

This Committee has been concerned with reasons for the depressed condition of the mining and production industries and the formulation of policies and programs by which the extremely vulnerable position of the country can be improved.

UNITED STATES IS THE MOST POWERFUL MINERAL-PRODUCING NATION IN THE WORLD

Competent mining engineers and producers before the committee took exception to the theory that the United States faces a crisis in its raw materials in the years ahead and that we have skimmed the cream of our mineral resources as we now understand them. Such conclusions have dangerous implications involving the safety and security of the Nation and have no basis in fact unless we destroy profit motive.

American resourcefulness in the utilization of our resources and the development of new techniques, substitutes, and replacements assures this Nation of a continually increased production and complete self-sufficiency in the Western Hemisphere.

The United States has been, still is, and will continue indefinitely to be the world's greatest producer of mineral wealth if the profit incentive is maintained. With the possible exception of the U. S. S. R., no other world power can develop within its own borders mineral power equal to that of the United States.

HOW CAN THE NATION'S MINERAL POSITION BE STRENGTHENED?

A sound program to accomplish this objective involves two major lines of attack—a "going-concern" industry coupled with an adequate stockpile of each critical material.

It is imperative that we take action now to establish incentives for our domestic producing industries, which must always constitute our first line of defense in preparedness. A "going-concern" industry is in itself the most dependable stockpile. It was pointed out with emphasis that stockpiles by themselves do not give adequate protection.

The lead and zinc industries have been exceedingly hard hit by foreign low wage competition and stockpile dumping, with the result that domestic production has fallen rapidly since the height of the Korean mobilization program.

Not only has the domestic economy suffered as a result of this economic loss, but the national security has been weakened by the

undermining of its first line of defense in these two indispensable critical materials. Along with the wiping out of the profit incentive in domestic mining, there has been an automatic decline in the prospecting and exploration activity of producing organizations, without which domestic mining cannot survive.

MINERAL EXPLORATION SHOULD BE STIMULATED

There was substantial agreement among the engineers and scientists that vast new mineral wealth will be discovered as new techniques develop and profit incentives are established. Many of the witnesses believed that fundamental research on the problem of finding ore deposits has long been neglected and that official attention be directed to this important field.

They found a deplorable lag in basic geological mapping of potential mineral districts. Although the United States Geological Survey has been conducting mapping services since 1880, less than 1 percent of the area has been included in geological investigations, 12.7 percent of the Nation's surface has been geologically mapped, and 31.1 percent topographically mapped. These activities should be speeded by the provision of additional funds for this purpose.

The going-concern mining industries in the United States are today the most effective contributors to the discovery of new mineral wealth.

SEARCH FOR SUBSTITUTES FOR STRATEGIC MATERIALS SHOULD BE EXPANDED

Research looking toward the development of substitutes and replacements for these materials should be an important objective of national mineral policy. Despite the fact that the Stockpiling Acts of 1939 and 1946 both include directives for this type of activity, limited funds have been appropriated for this purpose. This phase of our mineral preparedness program should be revived and that ample funds should be provided to those agencies qualified to conduct the necessary research.

SEA TRANSPORT MAJOR WARTIME HAZARD—LARGE TONNAGE

The 10 minerals and metals listed below comprise the group involving tonnages sufficiently large to pose major problems of transportation either by land or sea. During World War II the loss of ships carrying manganese and chromite ran as high as 85 percent during some months. No calculation is available, and probably one has never been made, of the final cost per ton of ore actually delivered to our ports. But when all the costs are added—of loss of men, ships, and cargoes and of maintaining the aircraft, surface, and underwater warships necessary to convoy and protect the shipments—the total cost must certainly have reached many thousands of dollars per ton of ore delivered.

Total supplies, including domestic production, 1952

	Tons (in thousands)	Shipments, percent	
		Land	Sea
1. Iron ore.....long tons..	107,074	89.9	10.1
2. Bauxite.....do....	5,213	32.8	67.2
3. Manganese.....short tons..	2,794	9.1	90.9
4. Copper.....do....	2,447	80.2	19.8
5. Chromite.....do....	1,721	1.2	98.8
6. Lead.....do....	1,396	78.7	21.3
7. Zinc.....do....	1,289	90.2	9.8
8. Fluorspar.....do....	705	77.6	22.4
9. Nickel.....do....	109	87.8	12.2
10. Tin.....long tons..	113	----------	100.0

Bolivia has been in the past and is capable of again becoming the second largest producer of tin in the world, second only to Malaya. The annual consumption of primary tin for commercial use in the United States approximates 50,000 to 60,000 long tons. Bolivia supplied more than 50 percent of the primary requirements of the United States in 1946 and, under suitable political and economic conditions, could do so again.

Chromite presents the most difficult problem of all in this list of the 10 large-tonnage minerals, however, the economic production in this country can be materially increased through establishing a definite profit incentive. Lines of supply in the Eastern Hemisphere are exceedingly vulnerable. Urgent research work is needed on the deposits in Cuba, the United States, and Canada.

The minerals listed below comprise a relatively low tonnage group which, if necessary, could be transported by airlift.

	Domestic—1952		Principal source
	Production	Consumption	
Cobalt.....short tons..	625	4,600	Africa.
Columbium-tantalum.....do....	1	500	Do.
Corundum.....do....	----------	5,000	Do.
Diamond (industrial).....million carats..	----------	11	Do.
Graphite.....short tons..	1,800	7,500	Ceylon, Madagascar.
Jewel bearings.....million..	10.6	77.3	Switzerland.
Mercury.....flasks..	14,000	58,000	Spain-Italy.
Mica.....short tons..	----------	7,000	India.

MINERALS-RESEARCH PROGRAMS

It is not possible to set forth here the cost of research work on individual minerals. A program is recommended for the Bureau of Mines and the Geological Survey on a 5-year basis at a cost of $50 million annually. This was based on available facilities and personnel that could be secured. If private organizations and universities also were used, the amount could easily be doubled to advantage.

Some idea of the cost of research may be gained from the contracts let by the General Services Administration in the last 3 years. Work on manganese, cobalt, nickel, and columbium-tantalum totals $5.5

million, and pilot-plant work on nickel, cobalt, and titanium totals an additional $8.2 million.

Research work on the following list of materials was declared needed. The type of research is indicated for each.

Asbestos

The Western Hemisphere is self-sufficient in chrysotile but research is needed to develop substitutes and synthesis for the strategic types, amosite and crocidolite.

Chromium

Laboratory work on Cuban deposits and prospecting for new large deposits is needed, as well as exploration on known deposits, such as the Oregon beach sands. The long-time profit incentive will result in a tremendous added reserve.

Cobalt

Research to solve the problem of economic recovery on the large deposits in the United States and Cuba would make the Western Hemisphere self-sufficient.

Columbium-Tantalum

Prospecting and exploration in the United States is needed with research on beneficiation. Large potential reserves in Brazil should be investigated.

Corundum

Prospecting for deposits in the United States and Canada. Research on substitutes.

Diamonds, Industrial

Research on substitutes and further development of other grinding methods. Progress has already been made on both.

Fluorspar

Research on recovery of fluorine from phosphate rock.

Graphite

Research needed to develop beneficiating methods to utilize abundant low-grade reserves for strategic purposes.

Manganese

Research work on beneficiating enormous low-grade deposits has already been started under commitments of the General Services Administration. Experts state this work should be expanded and continued until the problems are solved. This is one of the most important items on the list. Recovery of manganese from blast-furnace slags is another project currently underway. Results should be available by the end of 1954.

Mica

Research by both Government and industry already underway should be expanded and continued for substitutes, synthetics, and reconstituted forms. This work has already been unusually successful.

Nickel

While the Western Hemisphere (Canada) is self-sufficient, prospecting should be carried on in the United States, especially Alaska. Re-

search work on the Cuban ores is well underway through General Services Administration commitments. No effort should be spared until the job is finished.

Quartz Crystal-Radio Grade

Much research work has already been done on synthesis. The job must be finished.

Talc (Block)

The Government has done much work on substitutes and synthetics. The work should be continued until the job is completed.

Tin

Much work is being done by industry on substitutes—more should be done.

TARIFF PROTECTION

Many witnesses who were employed in the field of mining operations set forth their opinions that tariffs were needed which is summarized as follows:

1. Lead and Zinc

Almost two-thirds of the total consumption of both primary and secondary lead goes into 3 items—storage batteries, 34 percent; cable covering, 14 percent; and tetraethyl, 15 percent. Since 1945 the total consumption has ranged from 1 million to 1.2 million tons per year.

A flexible protection to permit the domestic industry to live probably would be less than a dollar per battery; in the case of tetraethyl it would not add more than a slight fraction of a cent per gallon of gasoline.

Approximately 50 percent of the total zinc supply is used in galvanizing, 28 percent in zinc base alloys, 12 percent in brass products which would become very much larger when ammunition production is heavy. In most uses zinc is a minor cost item so that the added cost to the manufactured article probably would not exceed a cent or less per pound.

2. Copper

There is a duty of 2 cents per pound on copper if the price falls below 24 cents. This was reduced from 4 cents under a trade agreement.

United States mine production, 925,000 tons, accounted for 30 percent of world production in 1953 and 65 percent of domestic consumption. An additional 250,000 tons will be coming in shortly, most of it under Government subsidy at 24.5 cents.

The electrical industry is consistently the largest consumer of copper, using from 55 to 60 percent of the total supply. The automotive and building industries take approximately 10 percent each.

Domestic producers could operate their mines at capacity at all times if they had protection on a fair and reasonable basis of competition. The average weight of copper for all cars and trucks is estimated at 50 pounds, so even if the duty were 10 cents per pound the additional cost per car would only be $5, and only a few cents per article for most items containing copper. The per capita consumption is approximately 23 pounds.

3. Manganese

Approximately 15 pounds of manganese is used in the production of 1 ton of steel. The current open-market price for imported ore is $1.10 per long-ton unit or 5 cents per pound of manganese. The cost of 15 pounds therefore would be $0.75. Under the domestic manganese purchase program the Government is paying $2.30 per unit or at the rate of $1.72 for 15 pounds. If all manganese were paid for at the Government rate it would add 97 cents to the cost of 1 ton of ingot. The current price of pig iron ranges from $56 to $62, therefore the increase in cost of steel per pound would be negligible.

4. Mercury

The current price of mercury (June 1954) is $275 per flask (76 pounds) in New York. This is the highest price in the history of the industry for many years. This price would permit the operation of many American mines, but there is always the certainty that as soon as the mines got into production the Spanish-Italian cartel would drop the price and close them, as has happened before.

The duty at present is 25 cents per pound, or $19 per flask. This is not sufficient to permit the domestic producer to compete on a fair and reasonable basis with low-cost labor foreign production. A healthy domestic industry is necessary to protect domestic consumers at all times, in peace as well as in war. The theory that we should buy on world markets at the cheapest price fails completely when there is nothing to keep the foreign producers in check, as is shown so clearly for mercury.

The three principal uses of mercury are for electrical appliances, agriculture, and industrial control instruments, which take approximately one-half of the average annual consumption of 55,000 to 60,000 flasks. Even if the present duty of 25 cents per pound was raised to $1 a pound it would still only add a few cents to the cost of the final product. This applies especially to control instruments, where the cost of the mercury is a very small part of the total cost of the instrument.

5. Tungsten

The tungsten industry has had a checkered career for many years. Between 1934 and the early part of 1951 the price has fluctuated between $14 and $85 per short-ton unit (20 pounds) of tungsten trioxide. Currently (April 1954) prices are quoted in London at around $30. The domestic floor price is $63 under the Government's domestic tungsten program, the termination date of which is July 1, 1958, as established by recent act of Congress.

The tungsten mines were shut down after World War II owing to lack of protection against low-wage foreign competition. The domestic mines are now capable of supplying peacetime domestic needs, and their production was vitally necessary in World War II and for the Korean war mobilization. It took 2 years and more to reopen them and operate them at capacity at a time when they should have been in full production.

The present duty of 50 cents per pound of metallic content on concentrates does not in any way retard the foreign flow to this country. In 1949 China produced one-half of the world supply and, if oppor-

tunity offered, could again flood the United States at a price not to exceed $14 per unit, duty paid. Tungsten is very high on the critical list.

CRITICAL AND STRATEGIC MINERALS IN CHINA

China is known to have significant reserves of virtually all critical and strategic minerals.

Should peace come in Asia and exports again start flowing to the United States, one witness testified, our domestic mineral industries could be wrecked under our inadequate tariff system as it is operated by the State Department under the Trade Agreements Act of 1934. It was further stated that mineral producers in the United States and the Western Hemisphere cannot compete on a fair and reasonable basis against labor that is virtually slave labor under one of the lowest standards of living in the world. The question was asked, should the safety and security of the Nation be allowed to rest on cheap material coming from a source that is and will continue to be notoriously antagonistic, whose ultimate objective is to assist in destroying the United States economically?

DEFINITIONS

The following definitions of mining terms were given the subcommittee by mining experts:

DEFINITIONS: PROSPECTING, EXPLORATION, DEVELOPMENT

Prospecting

The search for minerals or metals.

Until recently the discovery of a mineral deposit was based almost entirely on surface showings or underground information gained from mines working in the same area. Most of the world's great mines were discovered in this fashion.

In recent years new scientific principles have been developed, making possible discoveries of mineral deposits hidden far beneath the surface of the earth. Practically all oilfields have been discovered with the aid of these new devices, and vast areas in the West are being prospected for uranium in this manner. Important deposits of other minerals also have been found in this way.

Exploration

The work required after discovery to establish the quantity and grade of the deposit. Drilling, either by diamond core or other types, is commonly used today to delineate the limits of the deposit and to procure samples. Exploration may be performed in many other ways.

In every case exploration involves expenditure of risk investment because commercial reserves may or may not be proved after discovery.

Development

Preparation for future extraction of minerals or materials, including construction of surface plants as well as underground workings.

After the first large capital investment for this purpose has been made, development of the mine is usually limited to the workings necessary to maintain a predetermined production schedule for a

definite quantity of ore, concentrate, or refined product for a specified period. Because development is costly and ties up considerable capital, expenditures for this purpose are necessarily scrutinized carefully. In times of emergency, this work must always be neglected in favor of extractive operations.

Operation

This is self-explanatory, it involves continuous extraction, preparation, and marketing of a product.

Reserves

1. *Measured or blocked-out reserves.*—That area of a deposit that has been sufficiently disclosed by workings or drilling to permit actual measurement and sampling. Reserves of this type rarely go beyond the needs of a mine for more than 2 to 5 years as otherwise too much capital would be tied up in development work.

2. *Indicated or probable reserves.*—Sufficient work having been done on the deposit to permit a probable estimate of the quantity and grade of ore even though it cannot be accurately measured.

3. *Inferred or potential reserves.*—Estimates based very largely on geological factors with few, if any, samples or measurements. Such estimates involve considerable uncertainty but can be applied with varying degrees of validity to local areas or even the entire Nation when a reasonable amount of areal geology has been mapped. Good examples of such estimates are those that have been made for coal, iron, petroleum, and some other minerals that occur in widespread and large quantities in the United States.

Mining companies seldom include potential ores in their published estimates of reserves. Consequently such estimates represent very conservative appraisals of the ultimate production that can be obtained from a given area. State and Federal Government agencies and others occasionally publish estimates of reserves for the Nation as a whole which contain a very large proportion of potential minerals. The experts noted that estimates of reserves are influenced substantially by changing prices and technology. Higher prices and improved technology can bring about major changes in the outlook for continued mineral production. Unless these distinctions are clearly understood erroneous conclusions can be reached in the interpretation of reserve estimates.

These experts pointed out that fifty years ago, and even in recent years when many so-called experts have predicted that our supplies of petroleum, copper, iron, and many other minerals would last only a few years more, they have been confused as to the types of reserves they were talking about, and consequently their predictions of impending exhaustion were wrong. These mining men have accomplished such great advances in technology that in many cases worthless rock of yesterday has become pay ore today—a simple fact that escapes the attention of the pseudo mineral expert.

SERIOUS DECLINE IN NATION'S TECHNICAL GRADUATES

One of the most alarming symptoms of weakening industrial power of the Nation pointed out to the subcommittee is the declining number of technical graduates. For all technical graduates the decline has

been from 52,000 in 1950 to 18,000 in 1954. A hopeful sign set out is the freshman enrollment which has increased from 34,000 in 1950 to 60,000 in 1953. These men will be of little use to industry for another 8 to 10 years, and not over 50 percent will graduate. Of those who graduate, a goodly percentage do not continue in the engineering profession. It was stated by competent authorities that 30,000 technical graduates annually are required to keep the Nation in a foremost industrial position.

The mining industry is hit harder than any other industry in securing engineers. In 1951, 469 graduated from mining schools and in 1953 the number declined to 288. It is obvious that a dying industry has no attraction for the young technical men of today. This should, however, be of the utmost concern to the Government. It takes a good many years to educate and train a man to become a competent executive. There will not be time for this in the next emergency. The safety and security of the Nation are endangered by the mineral policies of the Government.

The following is a summary of the status of critical materials by expert witnesses from the Bureau of Mines.

ANTIMONY

1. United States

(*a*) *Primary production.*—1953 primary production was only about 2 percent of primary consumption or 400 tons, the record low since 1940.

(*b*) *Primary consumption.*—1953 domestic consumption was 14,300 tons. The average for 6 years 1948–53 was 14,800 short tons.

(*c*) *Present position.*—It was testified that the domestic mine production of primary metal virtually has ceased owing to foreign low-wage competition and inadequate tariff protection. The last important domestic producer was shut down 2 years ago and the mine equipment sold. Normally, some additional antimony is produced in the United States as a byproduct from the treatment of ores of silver, copper, lead, and zinc, principally from the Coeur d'Alene district in Idaho, but many of these mines have curtailed operations as a result of foreign competition in lead and zinc.

2. Western Hemisphere

The Western Hemisphere can be entirely self-sufficient.

In 1952 the Western Hemisphere produced 66 percent of the total world production, Bolivia and Mexico being the principal producers. Both have a high potential under favorable prices. Production could be stepped up if an emergency arose.

Preliminary estimates indicated that total mine production of antimony in the Western Hemisphere was about 8,000 short tons in 1953—a decrease of about 60 percent from 1952. This decrease was largely accounted for by the large decreases in production in Mexico and South America.

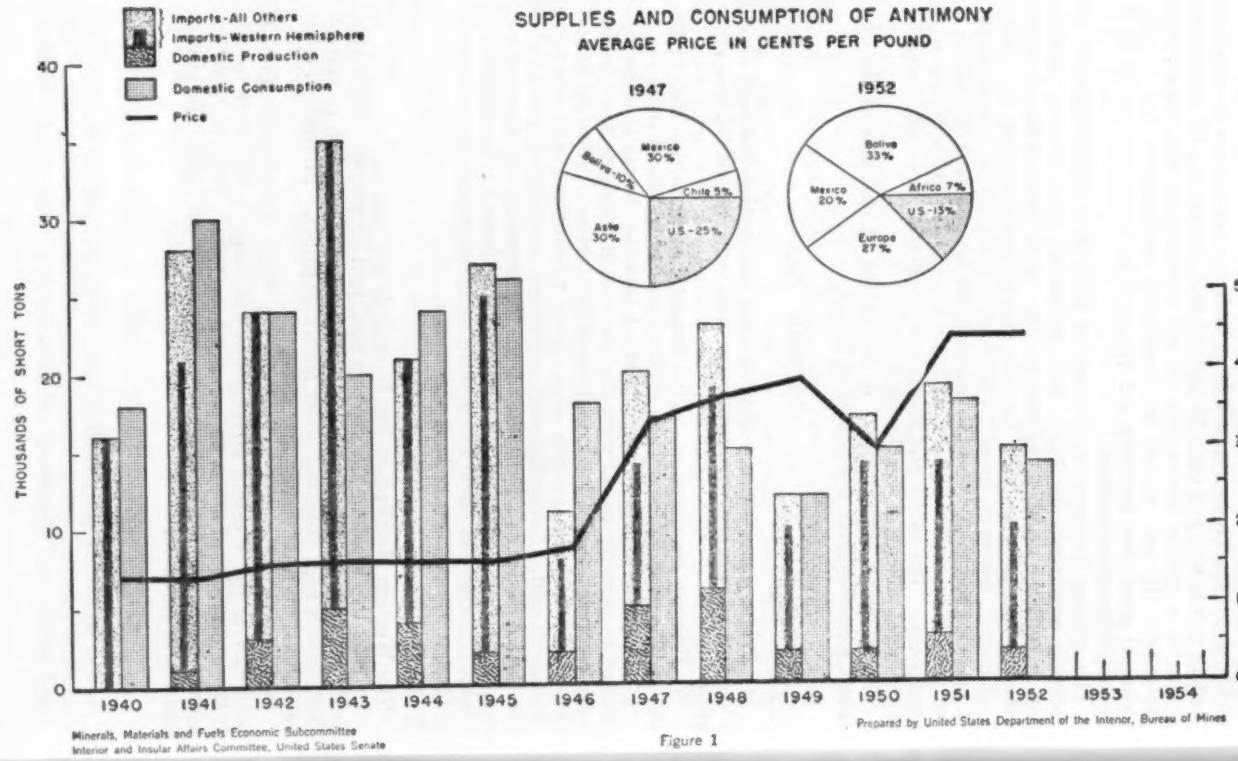
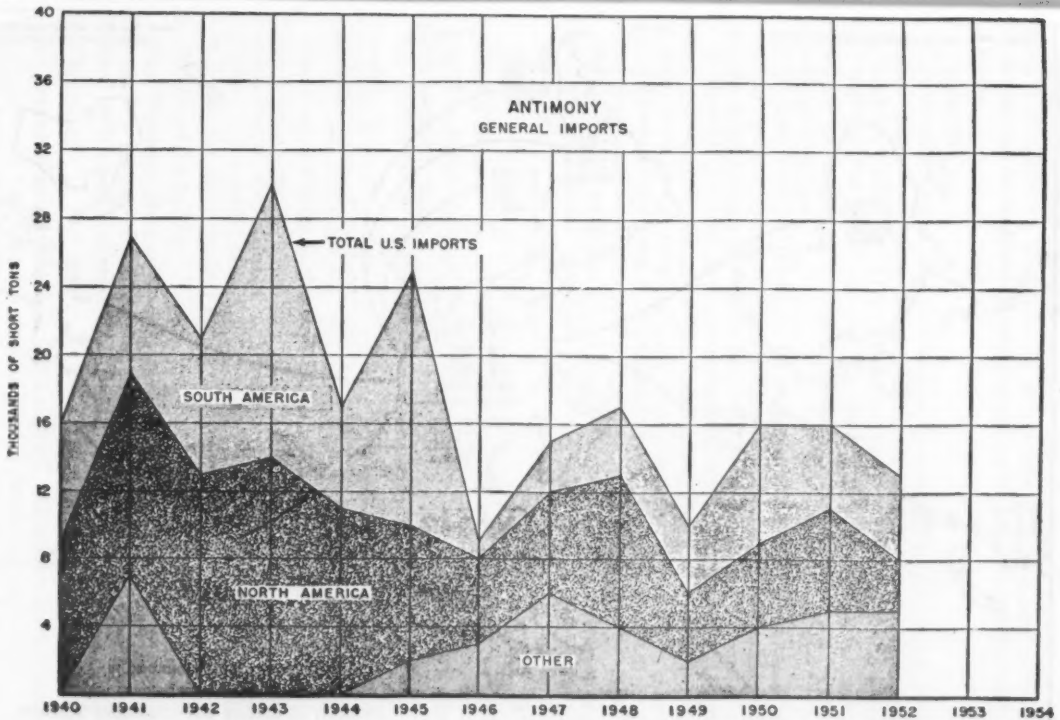

SUPPLIES AND CONSUMPTION OF ANTIMONY
AVERAGE PRICE IN CENTS PER POUND
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
1947
Mexico 30%
Bolivia 10%
Chile 5%
Asia 30%
U.S. 25%
1952
Bolivia 33%
Africa 7%
Mexico 20%
U.S. 13%
Europe 27%
THOUSANDS OF SHORT TONS
CENTS PER POUND
0
10
20
30
40
50
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Prepared by United States Department of the Interior, Bureau of Mines

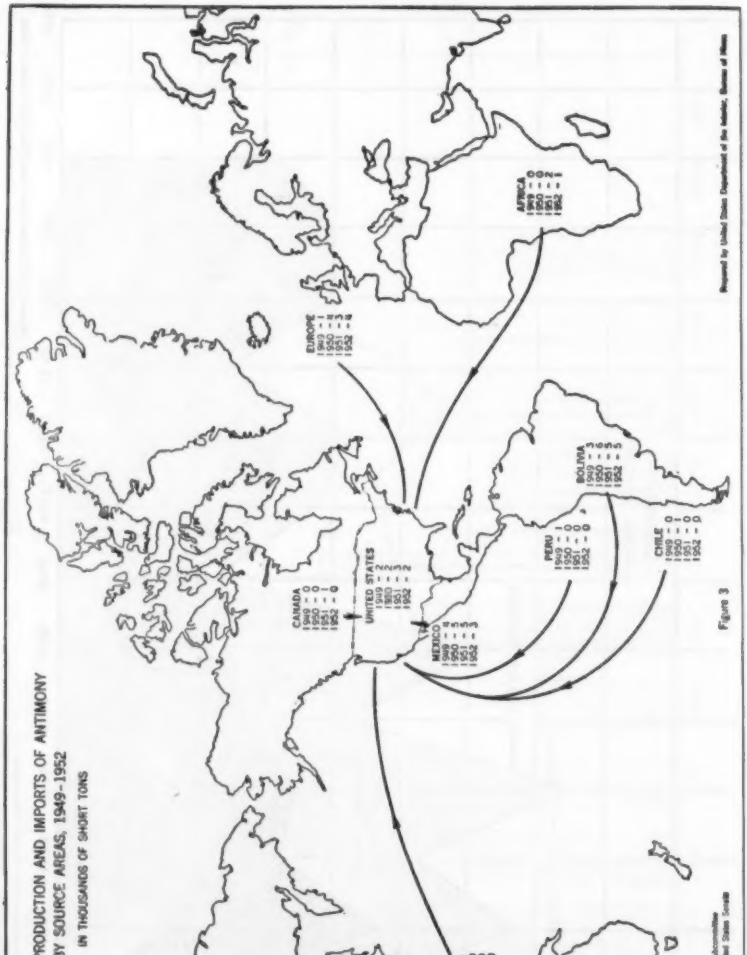
Figure 1



Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Prepared by United States Department of the Interior, Bureau of Mines

Figure 2


DOMESTIC PRODUCTION AND IMPORTS OF ANTIMONY
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF SHORT TONS
AFRICA
EUROPE
CANADA
UNITED STATES
MEXICO
PERU
BOLIVIA
CHILE
ASIA
1949
1950
1951
1952
Figure 3

The reserves and capacity exist in the Western Hemisphere and there is no question of continued production if actual and potential producers can be reasonably confident of a stable market over a period of time.

3. Comments

The world's largest and richest known reserves of antimony are in China. Metal produced under virtual slave labor can easily wreck the antimony industry in the Western Hemisphere. As long as the cold war persists, prudence requires that the United States take steps to assure its supply of this essential metal from domestic and Western Hemisphere sources.

A witness declared there is no question of a continued domestic economic production provided a principle of fair and reasonable competition with foreign nations is established by law.

In view of the deteriorated economic condition of antimony in the Western Hemisphere and the practical impossibility of a rapid step-up in production in the event of war, emphasis must be placed on stimulating domestic production and building up a more adequate stockpile.

Substitutes: None adequate in the most important uses.

Uses: Mainly as a hardening element with lead. Used in storage batteries, type metal, bearings.

See page 130, part 1, for details.

ASBESTOS

1. United States

(*a*) *Production in 1952.*—Chrysotile production 52,000 short tons; other varieties, none.

(*b*) *Consumption in 1952, approximate short tons:*

Amosite	19,000
Crocidolite	7,000
Chrysotile	700,000

The United States is the world's largest consumer of asbestos. A great consuming industry has been built up under conditions of overwhelming dependence on foreign supplies. Domestic mines furnish 6 to 8 percent of requirements of all grades and not more than 1 to 2 percent of important strategic grades.

2. Western Hemisphere

The Western Hemisphere is entirely self-sufficient in chrysotile. Bolivia is a source of crocidolite; production, no doubt, could be expanded with additional effort.

3. Comments

All grades of asbestos are in short supply. Government assistance for exploration and research on substitutes should be continued.

Total world production of all grades in 1952 was 1,562,500 short tons.

Extensive research has been conducted on the development of substitutes capable of replacing asbestos. These include glass fiber and a variety of other insulating materials.

The Western Hemisphere can be considered self-sufficient in chrysotile. It has a source of strategic-quality crocidolite in Bolivia, and this position is fortified by the development of glass-fiber substitutes

in strategic uses. Other substitute materials may be used in emergencies for nonstrategic applications.

Some progress is being made toward the reduction of the present high degree of United States dependence on foreign sources of amosite, but any major improvement in this situation will depend upon continued and intensified research. In general, the best prospect for improvement in the self-sufficiency of both the United States and the Western Hemisphere as a whole lies in the field of research on substitutes and on asbestos synthesis. There is also some prospect of discovering additional commercial deposits of natural chrysotile in the United States. Exploration for such deposits is fully justified, and Government aid may be obtained through the Defense Minerals Exploration Administration.

Substitutes: Glass fiber for amosite and crocidolite.

Uses: Asbestos-cement products, electrical insulation, brake linings.

See page 294, hearings, part 1, for details.

BAUXITE AND ALUMINUM

1. United States

(*a*) Production of bauxite in 1953, 1,582,000 long tons; production of primary aluminum, 1,252,000 short tons.

(*b*) Consumption of bauxite in 1953, 6 million long tons.

2. Western Hemisphere

The Western Hemisphere is entirely self-sufficient in bauxite, the mineral from which aluminum metal is produced. Large deposits currently under development and operation in Jamaica, Haiti, and the Guianas insure ample supplies of high-grade ore for the foreseeable future.

(*a*) Western Hemisphere production of bauxite in 1953 estimated at 9 million long tons. In 1952 the production was 59 percent of total world supply. Primary aluminum production estimated at 1,800,000 short tons in 1953.

3. Comments

United States sufficiency can be increased by further knowledge in processing (1) high-silica bauxite, (2) aluminous clays and rocks. Research in these problems should be encouraged.

Total world production of bauxite in 1952 was 14,120,000 long tons.

The United States production of bauxite in 1953 was approximately 27 percent of the total supply available to the country. Domestic primary aluminum production accounted for 80 percent of the primary aluminum supply (production plus net imports). Seventy percent of the imported primary aluminum came from Canada.

The tremendous strategic significance of aluminum is due primarily to its use in the manufacture of aircraft. In addition, aluminum is used extensively as a substitute in applications where other metals were traditionally used. In the transportation industry it has been substituted for iron and steel, in the electrical industry for copper, in the packaging industry for tin, and in the building industry for a wide variety of products such as steel, wood, etc. These substitutions have resulted in most cases in less costly, more efficient, and longer lived products. It is thus obvious that other materials can be substi-

tuted for aluminum in uses other than aircraft when this metal is in short supply.

Magnesium has been substituted for aluminum in some instances, and such substitutions will probably increase as new magnesium alloys with higher strengths are developed. Other substitutes for aluminum are the plastics; however, such substitution is limited by the properties of the nonmetallic materials.

Other important industries that use bauxite as a raw material include the manufacture of abrasives, chemicals, refactories, and cement; bauxite is also used in oil refining. From this list it can be seen that virtually all of the industries which use bauxite are important to national defense.

In 1951 and 1952 approximately two-thirds of the world production of virgin aluminum metal was obtained from reduction plants in Canada and the United States. The North American Continent has very limited reserves of bauxite, Canada being totally dependent on imported ore. Most of the imported bauxite comes from South America, but immense deposits recently discovered in the Caribbean Islands will make major contributions in the near future.

Bauxite reserve estimates can be considered only as approximations because of incomplete data and the fact that the various grades of ore are not interchangeable; however, the following estimate indicates the magnitude of reserves in the areas from which the United States and Canada now receive bauxite.

	Millions of tons
United States	35
Jamaica	320
Haiti and Dominican Republic	30
Surinam	42
British Guiana	52
French West Africa	140

Other potential sources include the large reserves of Brazil, 192 million tons, and the Gold Coast, 230 million tons. The size and proximity of the Jamaican deposits have done much to allay the fears of being cut off from metal-grade ore supplies during wartime. The Jamaican and low-grade domestic bauxites require slightly different equipment for producing alumina than the higher-grade South American ores. Alumina plants in operation or under construction in the United States are listed below:

Company	Location	Source of bauxite	Capacity (short tons)
Alcoa	Mobile, Ala	Surinam	837,000
Do	East St. Louis, Ill	do	328,500
Do	Bauxite, Ark	Arkansas	401,500
Reynolds	Hurricane Creek, Ark	Arkansas-Jamaica	725,000
Do	La Quinta, Tex	Jamaica	365,000
Kaiser	Baton Rouge, La	Jamaica-Surinam	780,000

48427°—54——5

Stockpiling

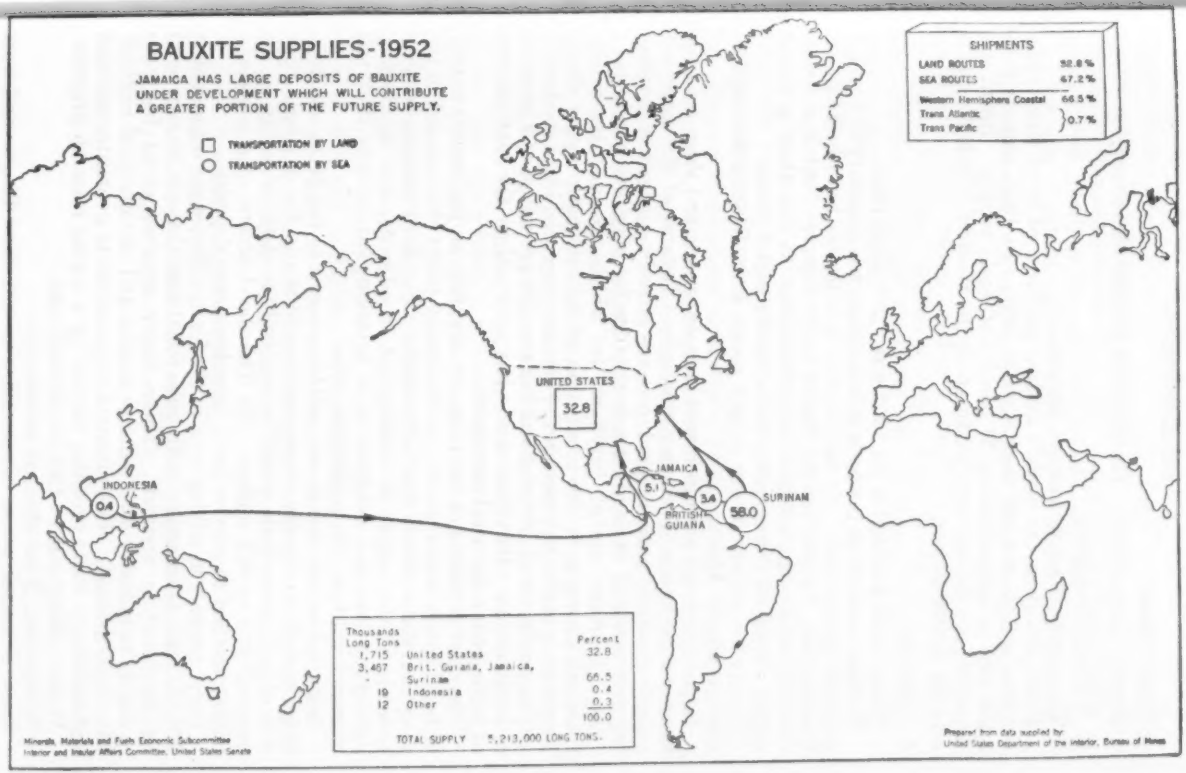
The accumulation of stockpiles of aluminum, bauxite, and cryolite (necessary for the electrolysis of alumina) is only a partial and short-range solution to the supply problems. Stockpiles of aluminum and bauxite are being accumulated to serve different purposes; bauxite will serve as a source of ore during the period necessary to convert the bauxite consuming industries to the use of domestic bauxite; the aluminum stockpile is to be used to supply the sharply increased demands at the beginning of war while domestic production capacity or other supply sources are begin expanded. The accumulation of bauxite thus represents a measure of security with respect to one raw material. An aluminum stockpile has manifold advantages; it represents a large stockpile of electric power, ocean transportation, time, and labor; it gives assurance to the military services that aluminum could be used for purposes that would best serve the military effort; it eases and facilitates conversion to a war economy; and, since storage costs are low, recent increases in costs of basic materials suggest that long-term financial savings may be realized by the program.

Much research has already been directed toward finding methods of using the vast quantities of lower grade aluminum-bearing materials as substitutes for bauxite. Alumina has been produced from some of these potential ores, but methods tried to date have not proved commercially competitive. The Bureau of Mines has recovered alumina from anorthosite and is currently conducting tests to demonstrate the possibility of using this and other aluminum silicates as sources of alumina. Should the United States be depreived entirely of imports and become short of metal-grade bauxite, the next best alternative now seems to be the use of low-grade bauxites. The term "low-grade" is a general term arbitrarily applied to relatively high-silica bauxite. In addition to these bauxites there are other aluminum bearing minerals with variable silica content ranging from that in currently acceptable grades of bauxite to that in clays which may exceed the alumina content. The use of high-silica raw materials would require additional processing facilities at alumina plants, and the investment and production costs would be considerably greater than under current practice.

Western Hemisphere: Entirely self-sufficient.

Substitutes: None needed.

Uses: Aluminum metal principal use (see p. 301, part I, for details).


BAUXITE SUPPLIES-1952
JAMAICA HAS LARGE DEPOSITS OF BAUXITE UNDER DEVELOPMENT WHICH WILL CONTRIBUTE A GREATER PORTION OF THE FUTURE SUPPLY.
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 52.8%
SEA ROUTES 47.2%
Western Hemisphere Coastal 46.5%
Trans Atlantic 0.7%
Trans Pacific
UNITED STATES
32.8
JAMAICA
5.1
3.4
BRITISH GUIANA
SURINAM
58.0
INDONESIA
0.4
Thousands Long Tons
1,715 United States 32.8
3,467 Brit. Guiana, Jamaica, Surinam 66.5
19 Indonesia 0.4
12 Other 0.3
100.0
TOTAL SUPPLY 5,213,000 LONG TONS.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by
United States Department of the Interior, Bureau of Mines

BERYL-BERYLLIUM

1. United States

Annual consumption. On the order of 3,500 short tons.

2. Western Hemisphere

The supply is ample to meet demands.

Brazil has been the world's leading producer of beryl since 1940, reaching a high of 3,400 short tons in 1949. In 1952, exports were 2,600 tons or approximately 37 percent of world supply. Brazil and Argentina are the only two producers in the Western Hemisphere outside the United States.

3. Comments

Total world production for 1952 was 7,200 short tons.

Further research on methods of beneficiation is necessary to increase domestic production. No satisfactory substitutes have been found. Furthermore, known United States beryl reserves that can be recovered by present methods are equivalent to less than a 3-year supply, based on consumption rates for the past 3 years.

Nearly 50 percent of our supply comes from Eastern Hemisphere sources, largely Africa.

Imports of beryl have increased in recent years, and there are large stocks in the hands of primary producers. Because of this improved supply situation, primary producers are actively engaged in developing new uses and in creating new markets for beryllium products.

An important use of beryllium for which no adequate substitutes are known is in the production of high-strength copper alloys. Beryllium metal is also used in the atomic-energy field as a moderator and as a reflector of neutrons and has superior properties as a material of construction. Beryllium oxide has no equal in the manufacture of high-quality electrical porcelains.

The chief problems of the industry, are, first an inadequate supply of beryl concentrates; second, a continuing policy with regard to the usage and the availability of beryl stocks. The third problem is one of technology; the matter of working out an adequate and satisfactory mining method and determining a metallurgical process that will extract beryl from the pegamatite ores.

In regard to this metal, our problems seems to be: (1) A stockpile large enough to handle emergency requirements for 5 years. The cost of such a stockpile would be relatively modest, probably on the order of $10 to $12 million. (2) The development of a successful milling method to recover beryl from low-grade deposits.

Beryl reserves in milling rock in the United States are estimated at 270,000 tons, as compared with some 6,000 tons that can be recovered by hand-sorting methods. These larger reserves could be made available to industry after suitable mining and metallurgical methods have been devised. This ultimate requirement to guarantee national self-sufficiency could probably be met by a 5-year research program.

Western Hemisphere: Can be self-sufficient.

Substitutes: None that are satisfactory.

Uses: Principal use as copper alloy to withstand fatigue and wear and good electrical conductor at high temperatures.

See hearings, page 202, part 1, for details.

BISMUTH

1. United States

(*a*) Production in 1953: About 1,300,000 pounds.

Most of the bismuth produced in the United States is obtained as a byproduct from smelting domestic and foreign lead and copper ores and by refining imported bismuth bars containing lead as a major impurity.

(*b*) Annual average consumption, 1950–53: 1,500,000 pounds.

2. Western Hemisphere

The Western Hemisphere is self-sufficient for the foreseeable future. Production in 1952 was 2 million pounds. Peru, Mexico, and Bolivia, in the order named, are the suppliers. The production for 1952 was 39 percent of world output.

3. Comments

Although the sale of bismuth, particularly in the form of refined metal, was firm in 1953, the continued trend toward the reduced consumption of bismuth in pharmaceuticals was noteworthy, with the antibiotics replacing bismuth.

The Western Hemisphere, as a whole, produces far more bismuth than it consumes. Essential requirements for bismuth are now well provided for. If large additional supplies could be assured, new uses probably would develop, but as bismuth is almost wholly a byproduct of lead and copper, no practicable means is apparent to bring about a large increase in output.

An important quantity of bismuth is present in ores, anode slimes, and other plant byproducts; this may be commercial sources of bismuth of higher purity than is marketed today. Bismuth is not normally won from such material or from its ores by electrometallurgical methods. For this reason, a research program was initiated by the Bureau of Mines to investigate existing electrolytic methods of depositing pure bismuth.

During the past 2 years bismuth has become an important industrial material through the development of its alloys. Before this period the chief uses for bismuth were in the production of pharmaceutical salts and in the low-melting solders used in such devices as sprinkler-heads, fuse links, and other fire-prevention equipment. Experimentation and research have developed many new uses for the bismuth alloys. Today there are over 70 known useful ways of employing them.

Western Hemisphere: Self-sufficient.

Substitutes: None needed.

Uses: Low-melting solders, hardening alloys, pharmaceuticals.

See page 143, hearings, part 1, for details.

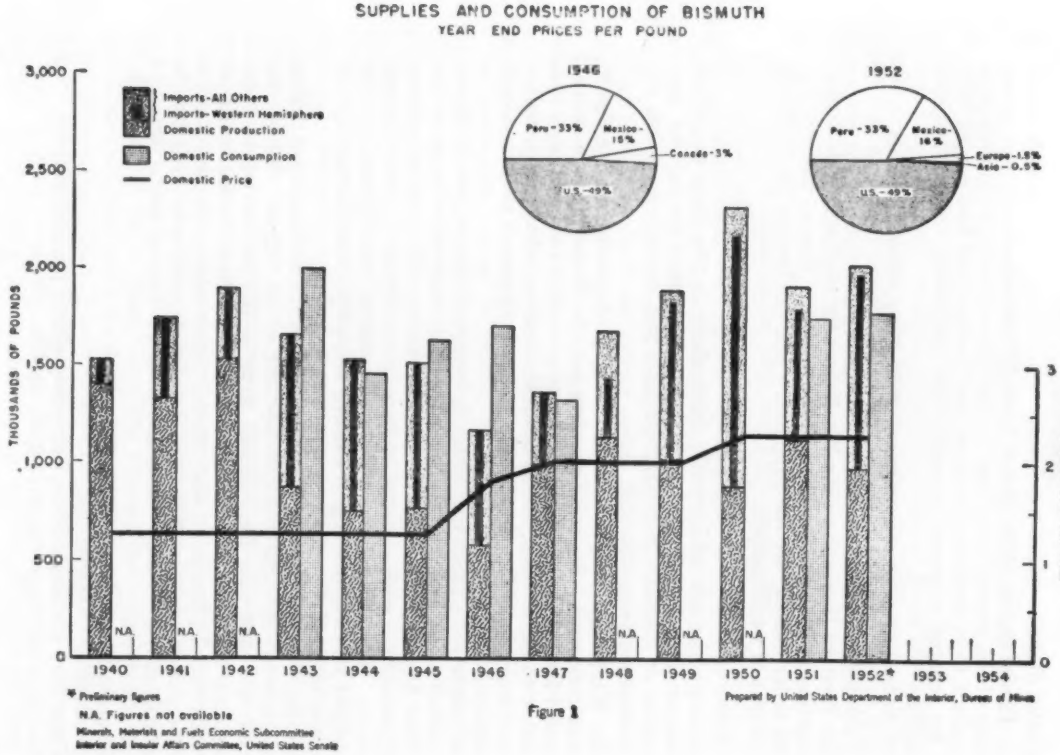

SUPPLIES AND CONSUMPTION OF BISMUTH
YEAR END PRICES PER POUND
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Domestic Price
1946
Peru-33%
Mexico-15%
Canada-3%
U.S.-49%
1952
Peru-33%
Mexico-16%
Europe-1.5%
Asia-0.5%
U.S.-49%
THOUSANDS OF POUNDS
DOLLARS PER POUND
3,000
2,500
2,000
1,500
1,000
500
0
3
2
1
0
N.A.
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
* Preliminary figures
N.A. Figures not available
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

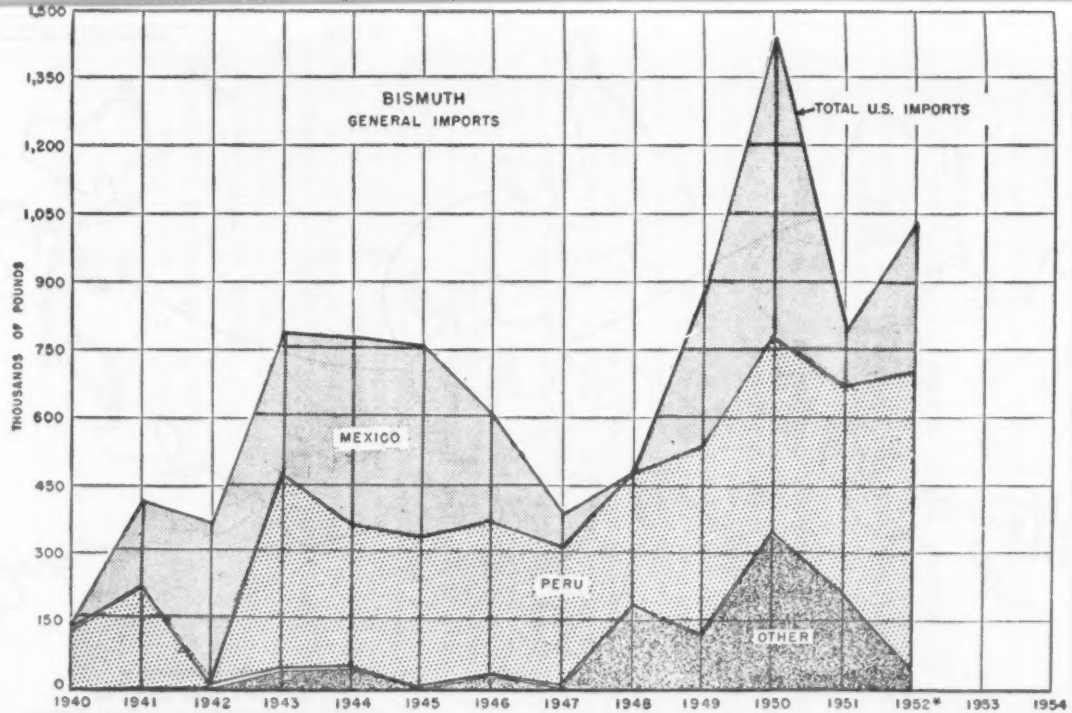
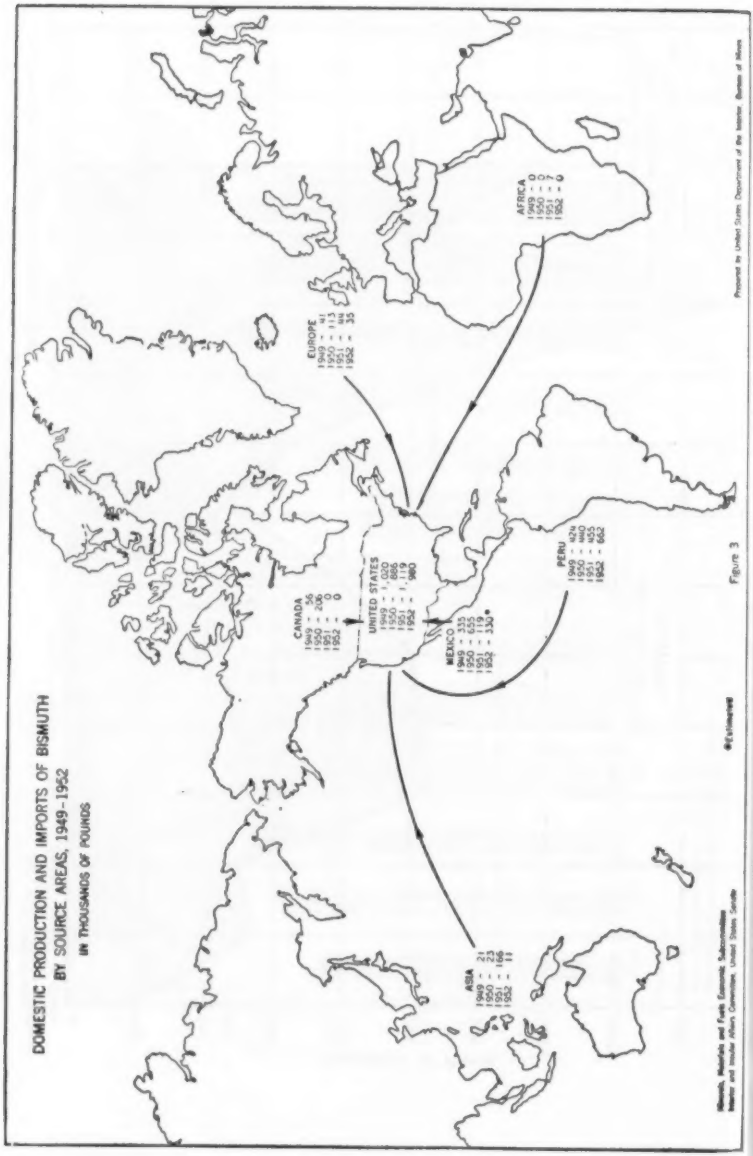

BISMUTH
GENERAL IMPORTS
TOTAL U.S. IMPORTS
MEXICO
PERU
OTHER
THOUSANDS OF POUNDS
1,500
1,350
1,200
1,050
900
750
600
450
300
150
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
* Preliminary figures
Prepared by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2


DOMESTIC PRODUCTION AND IMPORTS OF BISMUTH
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF POUNDS
AFRICA
1949 - 0
1950 - 0
1951 - 7
1952 - 0
EUROPE
1949 - 41
1950 - 13
1951 - 44
1952 - 35
CANADA
1949 - 56
1950 - 230
1951 - 0
1952 - 0
UNITED STATES
1949 - 1,020
1950 - 685
1951 - 1,319
1952 - 980
MEXICO
1949 - 335
1950 - 455
1951 - 119
1952 - 330*
PERU
1949 - NON
1950 - 450
1951 - 453
1952 - 662
ASIA
1949 - 21
1950 - 23
1951 - 16
1952 - 11
*Estimated
Figure 3
Prepared by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Senate Interior and Insular Affairs Committee, United States Senate

CADMIUM

1. United States

(*a*) *Primary production in 1953:* 9,600,000 pounds.
(*b*) *Primary consumption in 1953:* 9,800,000 pounds.

2. Western Hemisphere

(*a*) *Production.*—The United States, Mexico, Canada, Peru, and Bolivia annually provide three-fourths of total world supply and are amply self-sufficient. In 1952, production from the Western Hemisphere was 69 percent of the world total.

3. Comments

There are no ore reserves of cadmium. The entire domestic supply is obtained as a byproduct in the treatment of ores, flue dust, and concentrates of other metals, particularly zinc, 60 percent of which is of foreign origin.

Total world production in 1952 was 13,816,000 pounds.

In 1951 and part of 1952 the use of cadmium was restricted almost exclusively to the production of war goods or essential civilian products owing to its short supply.

In all likelihood the United States could count on enough cadmium to satisfy absolutely essential needs even if forced to rely on domestic resources alone. Widespread substitution and curtailment of consumption for all nonessential uses would be necessary if such a situation were prolonged.

Considerable substitution is possible in the purposes for which cadmium is used. Zinc can be employed as a substitute in many plating applications, the largest use of cadmium. Substitutes are also available for solders, fusible alloys, bearings, and pigments.

The Bureau of Mines is conducting investigations with the objective of increasing the yield of cadmium from zinc concentrates. The byproduct nature of cadmium operations make the industry almost entirely dependent upon activity in the zinc industry. In 1953 the chief concern of the industry was the large accumulated surplus of metal in inventory.

Western Hemisphere: Self-sufficient.
Substitutes: Zinc for plating.
Uses: Plating is principal use.
See page 143, hearings, part 1, for details.

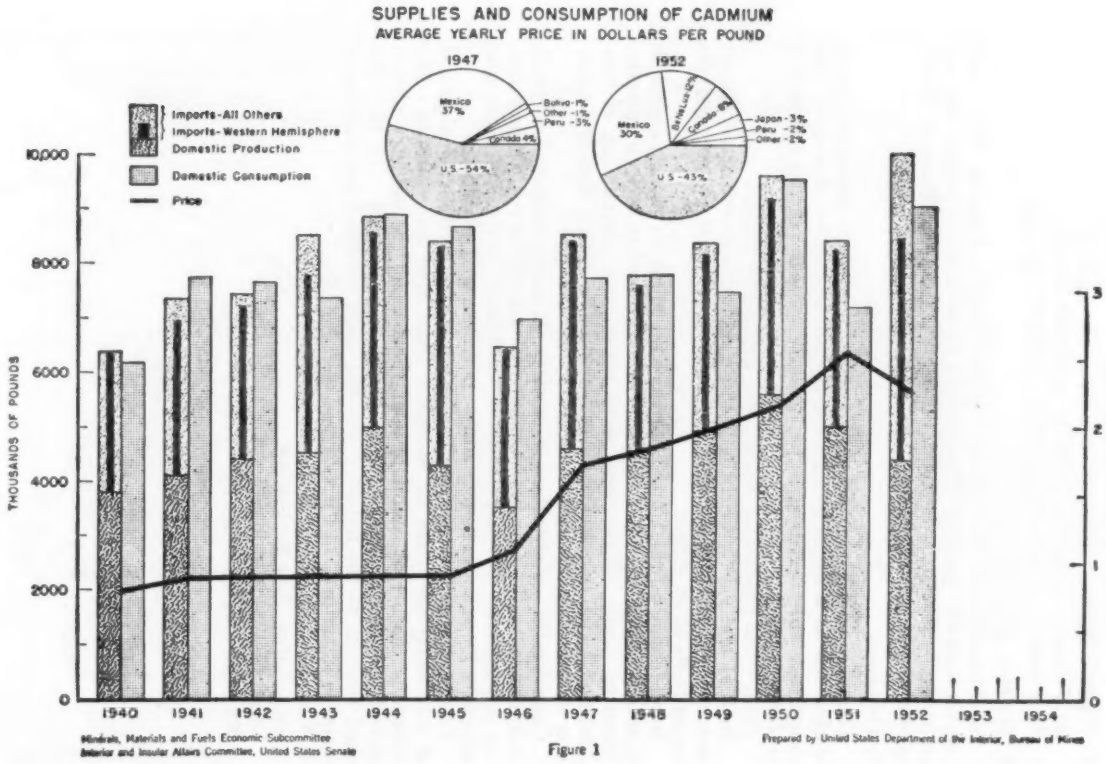

SUPPLIES AND CONSUMPTION OF CADMIUM
AVERAGE YEARLY PRICE IN DOLLARS PER POUND
1947
1952
Mexico 37%
Bolivia-1%
Other -1%
Peru -3%
Canada 4%
U.S.-54%
Mexico 30%
Canada 8%
Japan-3%
Peru -2%
Other -2%
U.S.-43%
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
THOUSANDS OF POUNDS
DOLLARS PER POUND
10,000
8000
6000
4000
2000
0
3
2
1
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

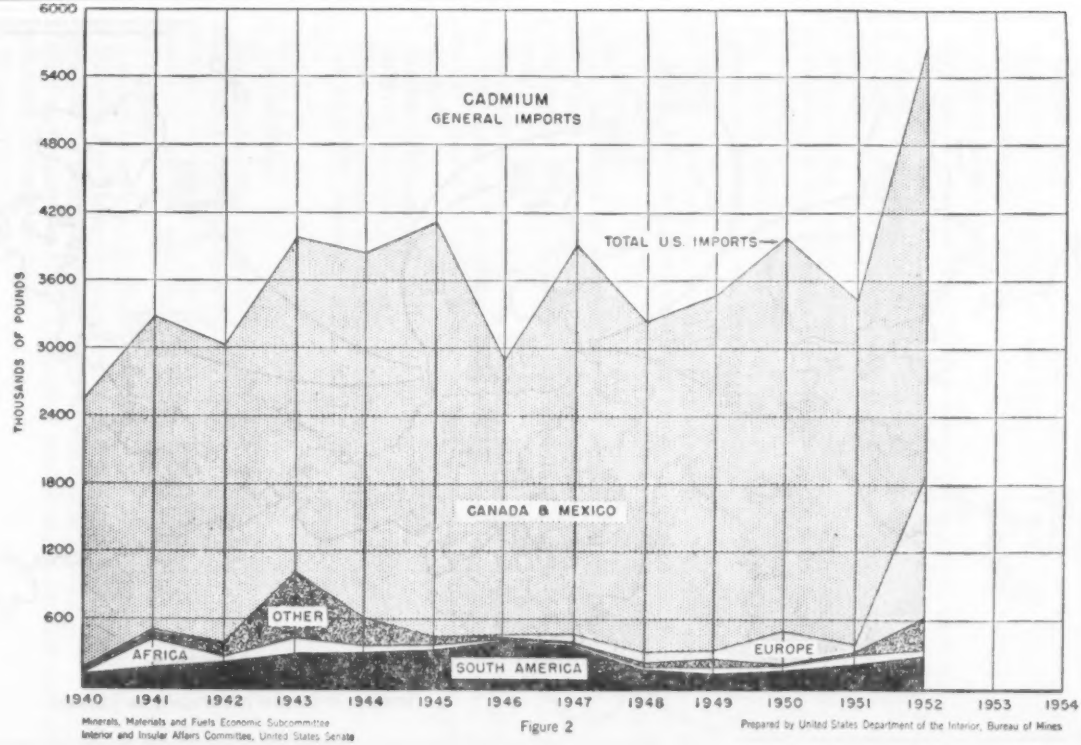
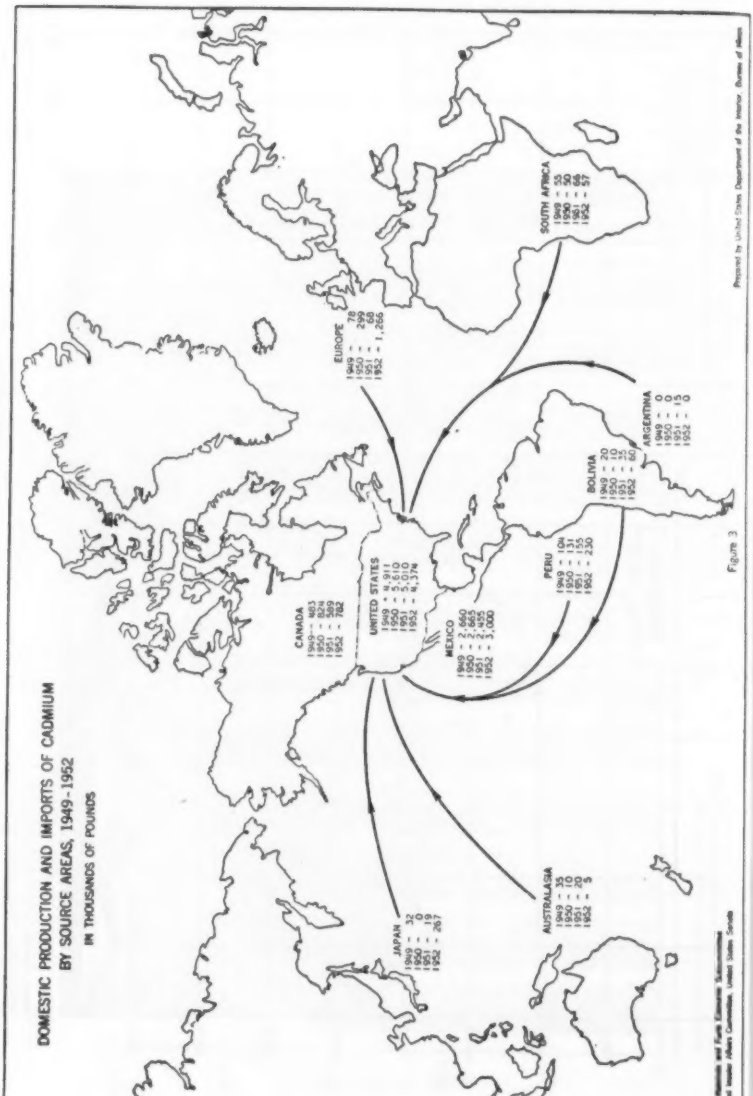

CADMIUM
GENERAL IMPORTS
THOUSANDS OF POUNDS
6000
5400
4800
4200
3600
3000
2400
1800
1200
600
TOTAL U.S. IMPORTS
CANADA & MEXICO
OTHER
AFRICA
SOUTH AMERICA
EUROPE
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2


DOMESTIC PRODUCTION AND IMPORTS OF CADMIUM
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF POUNDS
EUROPE
1949 = 78
1950 = 278
1951 = 68
1952 = 1,266
SOUTH AFRICA
1949 = 55
1950 = 50
1951 = 45
1952 = 57
ARGENTINA
1949 = 0
1950 = 0
1951 = 10
1952 = 10
BOLIVIA
1949 = 20
1950 = 10
1951 = 10
1952 = 60
PERU
1949 = 134
1950 = 115
1951 = 155
1952 = 230
CANADA
1949 = 903
1950 = 569
1951 = 569
1952 = 762
UNITED STATES
1949 = 4,911
1950 = 5,610
1951 = 5,610
1952 = 4,379
MEXICO
1949 = 2,640
1950 = 2,455
1951 = 2,455
1952 = 3,000
JAPAN
1949 = 32
1950 = 0
1951 = 0
1952 = 267
AUSTRALASIA
1949 = 15
1950 = 10
1951 = 20
1952 = 9
Figure 3

CELESTITE (STRONTIUM ORE)

1. United States

(*a*) Production: Small and sporadic.

(*b*) Consumption: Estimated at 8,000 to 14,000 tons a year.

2. Western Hemisphere

(*a*) Ample reserves of celestite, a strontium mineral, are known to be available in the United States and Mexico. In an emergency the Western Hemisphere could become self-sufficient. If a substantial demand could be established satisfactory domestic material could be produced.

Although the United States has adequate reserves of celestite, it now obtains nearly all of its commercial supply from foreign sources. The market for this commodity is small, and domestic producers do not find it attractive owing to transportation disadvantages and vigorous competition from foreign producers.

Recent domestic production has been very small and sporadic, generally not over a few hundred tons annually. There is a moderate output in Mexico. Good statistics are not available for the Western Hemisphere but the total probably does not exceed a few thousand tons annually.

The strontium compounds are well established in their markets, and although some replacement by other materials is possible and occasionally practiced, substitution is not viewed as an important factor.

Research has been done on processes for beneficiating the domestic celestite ores, and industry has expressed confidence that if a substantial demand develops, a satisfactory domestic material could be produced.

Western Hemisphere: Self-sufficient.

Substitutes: Not necessary.

Uses: Chemicals, flares, tracer bullets, fireworks.

See page 285, hearings part 1, for details.

CHROMITE

1. United States

(*a*) *Production.*—Numerous small deposits in California, Oregon, and Washington are producing ore under a Government-purchase program to meet stockpile specifications. Shipments in 1953 were 27,520 short tons, and the total amount delivered up to March 1, 1954, was 54,757 tons.

A separate contract in Montana calls for delivery to the Government of 900,000 short tons of concentrates in 8 years. This contract is in operation. Production could easily be doubled if necessary.

(*b*) *Consumption in 1953:* 1.3 million tons of ore or 560,000 tons of contained chromic oxide.

2. Western Hemisphere

(*a*) *Production.*—Cuba produced 40,000 tons of metallurgical grade and 58,000 tons refractory grade ore in 1952.

It is the only source of imports in the Western Hemisphere.

3. Sources outside Western Hemisphere

The principal sources for imports in 1952 of all grades of ores are as follows:

	Short tons
New Caledonia	58, 776
Philippines	543, 702
Southern Rhodesia	183, 572
Turkey	458, 343
Union of South Africa	299, 780

4. Comments

There are no known substitutes for most chemical and metallurgical uses of chromite.

The largest domestic reserve of chromite is in Stillwater County, Mont.

Cuba and the low-grade deposits of North America, including Montana, California, Oregon, Washington, Alaska, Oregon beach sands, and Bird River sands in Manitoba, constitute the most promising potential future sources of supply.

Intensive research should be directed toward means of utilizing concentrates from these sources.

More prospecting and exploration work should be directed toward finding new deposits in the United States and the Western Hemisphere. The occurrences in Alaska warrant further investigation. Two properties are shipping from there now.

It is readily apparent from the attached map showing chromite supplies for 1952 that this country's supplies would be exceedingly vulnerable in time of war, as they come mainly from Turkey, South Africa, and the Philippines.

The Cuban reserves are large and can be utilized with further technologic development. Intensive research work should be undertaken at once. Government research is warranted, as chromite-ore consumers have done very little work on Cuban chromite ores.

WESTERN HEMISPHERE PRODUCTION

Chromite output in the Western Hemisphere is estimated to be about 140,000 short tons, mined chiefly in Cuba and the United States with small quantities produced in Brazil and Guatemala. Reserves of low-grade materials (particularly Cuban laterites) are sufficient for several generations.

SUBSTITUTES AND REPLACEMENTS

An estimated 25 percent of the chromite used in making refractories, or about 8 percent of the total consumption, can be saved by substituting higher priced magnesite for certain refractory uses.

(*a*) *Research indicated.*—To make the United States self-sufficient in chromite within the Western Hemisphere it is necessary to establish a profit incentive through flexible duty or tariff to make domestic mining operations competitive on world markets; this requires continuing research on the utilization of lower-grade chrome ores.

SUPPLIES AND CONSUMPTION OF CHROMITE

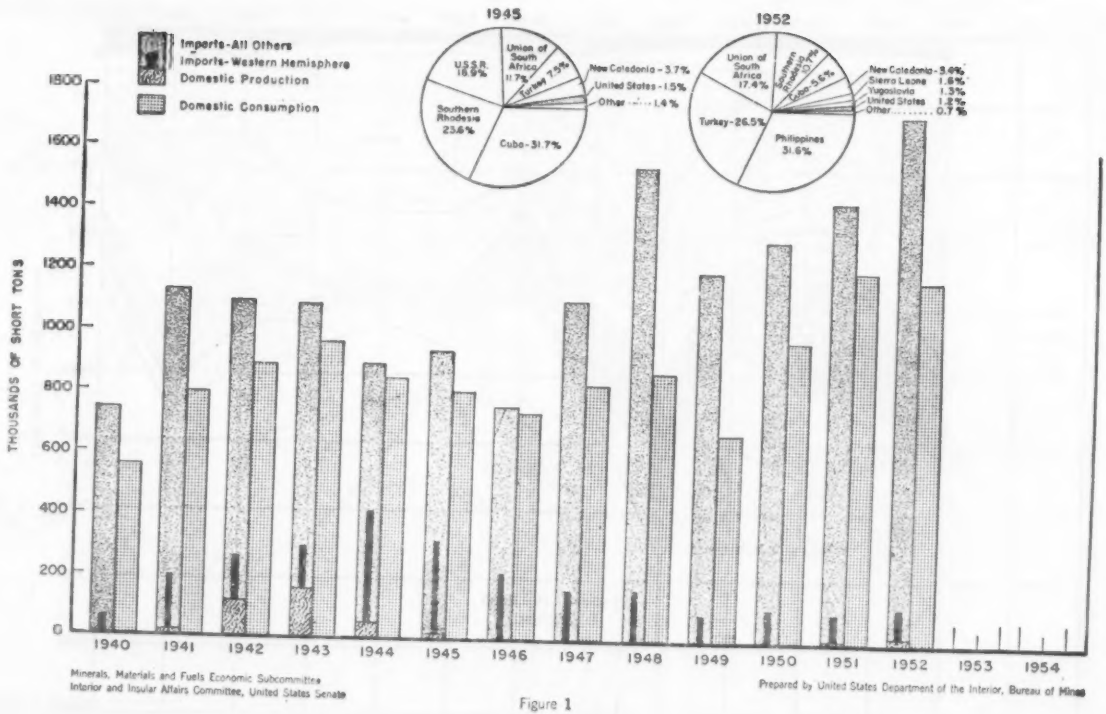


Figure 1

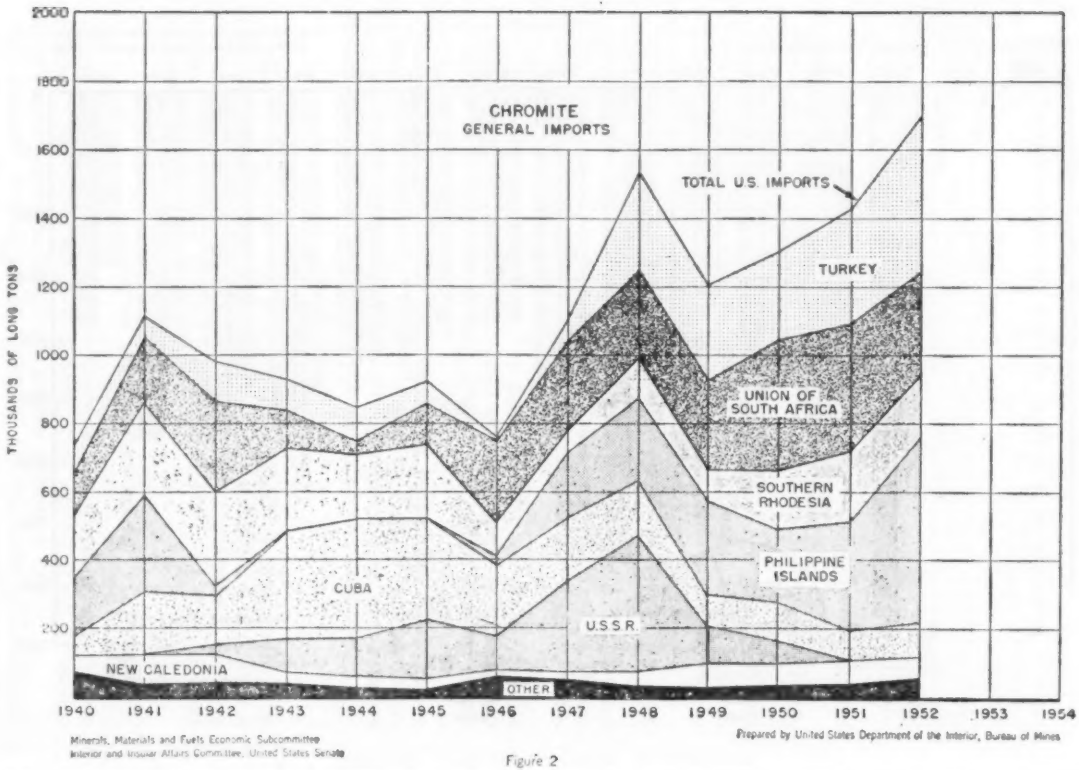

CHROMITE
GENERAL IMPORTS
TOTAL U.S. IMPORTS
TURKEY
UNION OF SOUTH AFRICA
SOUTHERN RHODESIA
PHILIPPINE ISLANDS
CUBA
U.S.S.R.
NEW CALEDONIA
OTHER
THOUSANDS OF LONG TONS
2000
1800
1600
1400
1200
1000
800
600
400
200
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

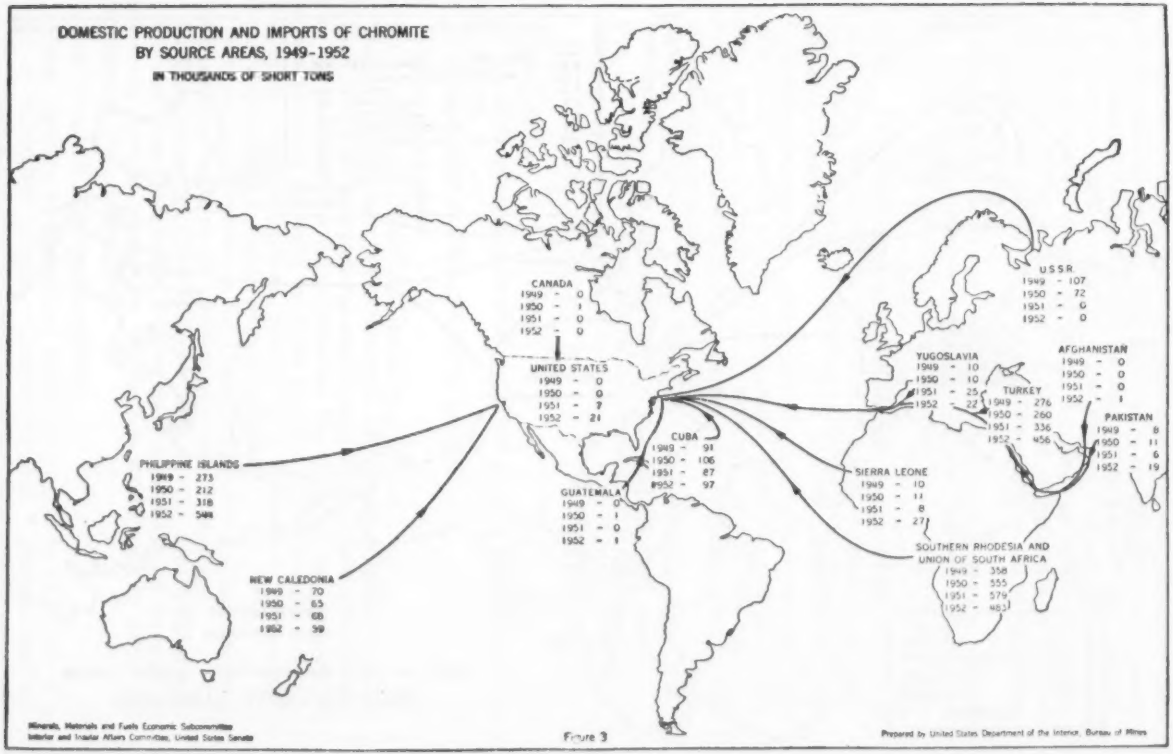
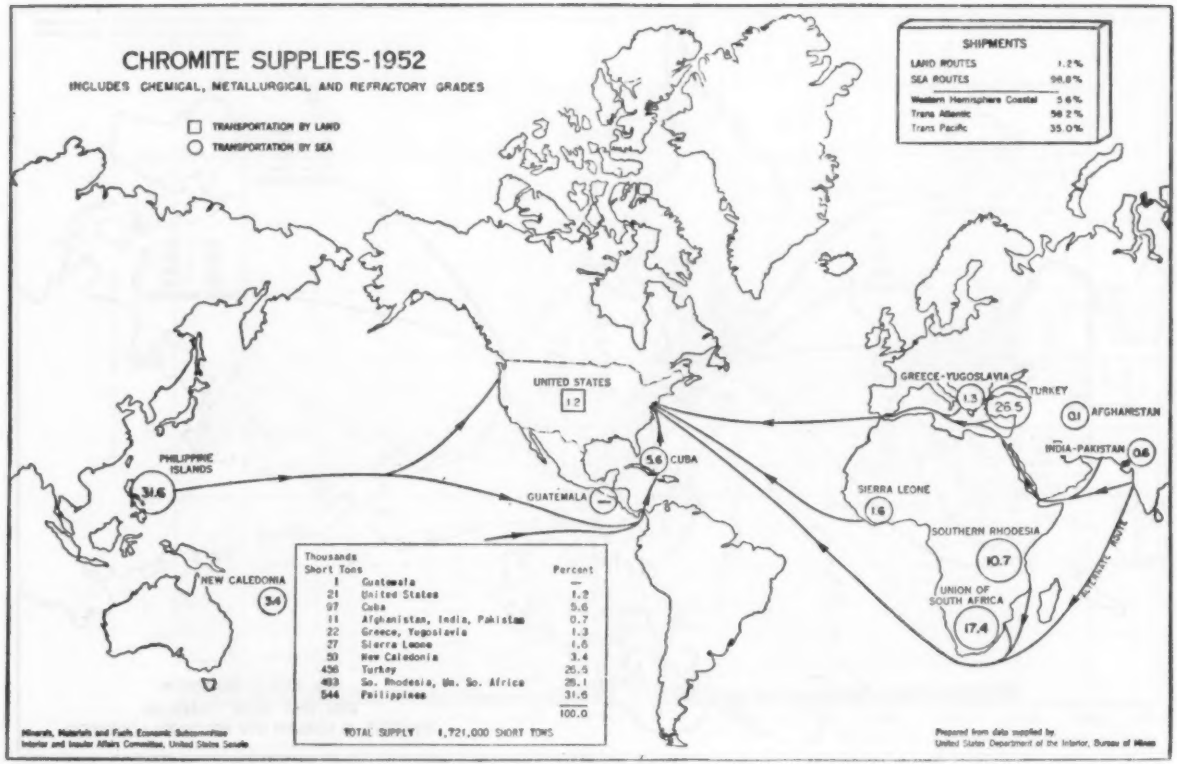


Figure 3

48127°—54——6


CHROMITE SUPPLIES-1952
INCLUDES CHEMICAL, METALLURGICAL AND REFRACTORY GRADES
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 1.2%
SEA ROUTES 98.8%
Western Hemisphere Coastal 5.6%
Trans Atlantic 58.2%
Trans Pacific 35.0%
UNITED STATES 1.2
CUBA 5.6
GUATEMALA —
PHILIPPINE ISLANDS 31.6
NEW CALEDONIA 3.4
GREECE-YUGOSLAVIA 1.3
TURKEY 26.5
AFGHANISTAN 0.1
INDIA-PAKISTAN 0.6
SIERRA LEONE 1.6
SOUTHERN RHODESIA 10.7
UNION OF SOUTH AFRICA 17.4
ATLANTIC ROUTE
Thousands Short Tons
1 Guatemala —
21 United States 1.2
97 Cuba 5.6
11 Afghanistan, India, Pakistan 0.7
22 Greece, Yugoslavia 1.3
27 Sierra Leone 1.6
59 New Caledonia 3.4
456 Turkey 26.5
493 So. Rhodesia, Un. So. Africa 28.1
544 Philippines 31.6
100.0
TOTAL SUPPLY 1,721,000 SHORT TONS
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by
United States Department of the Interior, Bureau of Mines

(*b*) *Special problem.*—The chief difficulty in most research on low-grade domestic ores is caused by a prejudice regarding the importance of the chrome-iron ratio in the ore and in the ferrochrome derived from such ore. A low ratio, or a low chrome content, will increase smelting costs per unit of chromium, but does not affect the value of the latter in the ferrochrome. Also, if offgrade ore is smelted directly, the cost will be much less than the cost of chemical upgrading followed by smelting.

Government research has been done mainly on domestic chrome ores, but the unsatisfactory situation of the Western Hemisphere whose resources of chrome are quite universally lower grade demands extension of such Government research to the ores of Cuba and Canada. The importance of stainless steel in all war production is so great that the supply of chromium for it must now be assured. There is in the Western Hemisphere sufficient quantity, but not in immediately usable form.

Stockpiling ferrochrome, rather than ore, will store power and labor in the same manner as the recommended stockpiling of aluminum metal. Such a stockpiling program may also provide the incentive required to establish an industry based upon domestic chrome, that could become permanent.

Western Hemisphere: With greater effort can be self-sufficient.

Substitutes: None for most chemical and metallurgical uses.

Uses: Important steel alloy, plating, abrasives, refractories.

See page 72, hearings, part 1, for details.

COBALT

1. United States

(*a*) *Domestic production in 1953:* 1,253,000 pounds which came from 2 producers.

(*b*) *Consumption in 1953:* 9,182,000 pounds.

2. Western Hemisphere

(*a*) *Production in 1953:* Estimated at 2,760,100 pounds.

The laterite deposits in Cuba contain the largest potential reserves in the world, but much research work is needed on methods of recovery. The General Services Administration has financed two projects of considerable size for work on these deposits. The present and contemplated nickel-extraction plants have potentially recoverable cobalt approaching 5 million pounds per year.

There are large deposits in the United States, but intensive research work is needed to solve the problem of economic recovery.

High-temperature alloys will be used in the future in greater quantities than ever before, hence every means should be used to encourage further production in the free world and to solve the problems of low-grade deposits.

3. Sources outside Western Hemisphere

Africa supplied 84 percent of world production in 1952 out of a total of 10,100,000 pounds. Canada supplied 6 percent and the United States 4 percent.

4. Substitutes and replacements

In general, most of the substitutes for cobalt represent downgrading, not only in alloy content but also in performance. The properties imparted to high-speed steels by cobalt make it most difficult to recommend substitutes or alternates. Low-cobalt, less efficient, or ordinary high-speed steel may be used, with loss in cutting speeds and production rates. Although less efficient, nickel can be used as an alternate for cobalt as a binder in sintered carbide tools and armor-piercing projectiles and some cobalt is saved in applications by using part nickel.

Western Hemisphere: Can become self-sufficient.

Substitutes: None that are equally satisfactory.

Uses: Steel alloy for high-strength and high-temperature uses.

See page 76, hearings, part 1, for details.

SUPPLIES AND CONSUMPTION OF COBALT
YEAR END PRICES PER POUND OF COBALT METAL
1947
1952
Belgian Congo - 90.4%
U.S. - 7.5%
Others - 1.5%
Mexico 0
Canada - 0.6%
Belgian Congo - 89.3%
U.S. - 8.5%
Others - 2.1%
Mexico 0
Canada - 0.1%
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Domestic Price
THOUSANDS OF POUNDS
DOLLARS PER POUND
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
3
2
1
0
N.A.
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
* Preliminary figures
N.A. Figures not available 1940 thru 1945.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

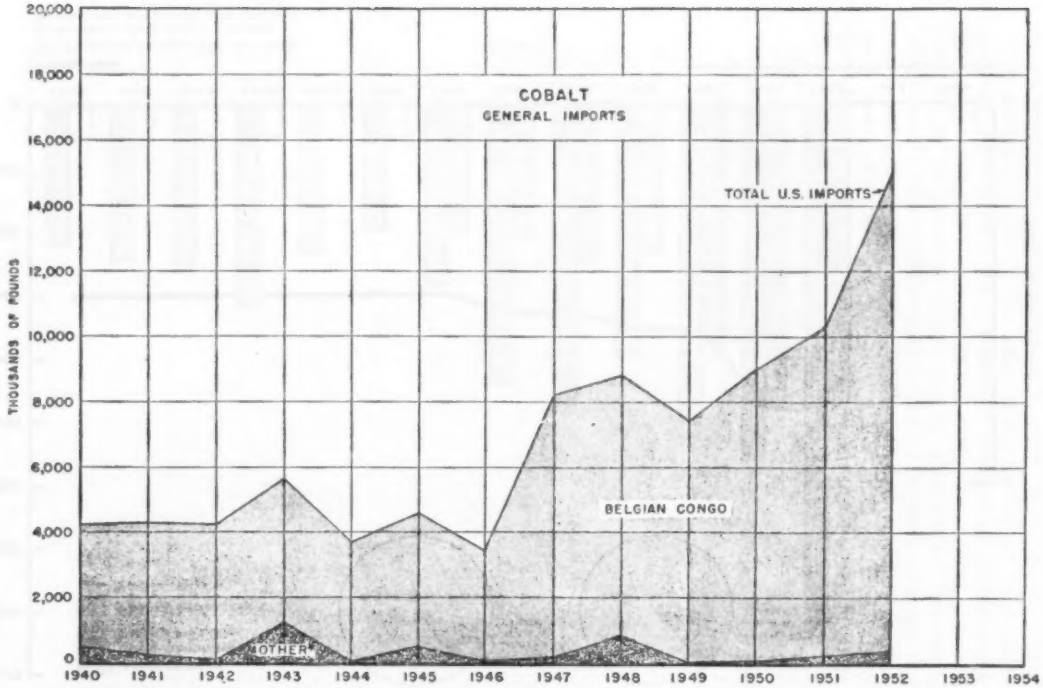

COBALT
GENERAL IMPORTS
TOTAL U.S. IMPORTS
BELGIAN CONGO
OTHER*
THOUSANDS OF POUNDS
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
*Due to German occupation of France 1,000,532 lbs. in 1943 and 28,413 lbs. in 1944 were shipped to the United States
In 1945 430,300 lbs. were seized by U.S. Army in occupation of Germany.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

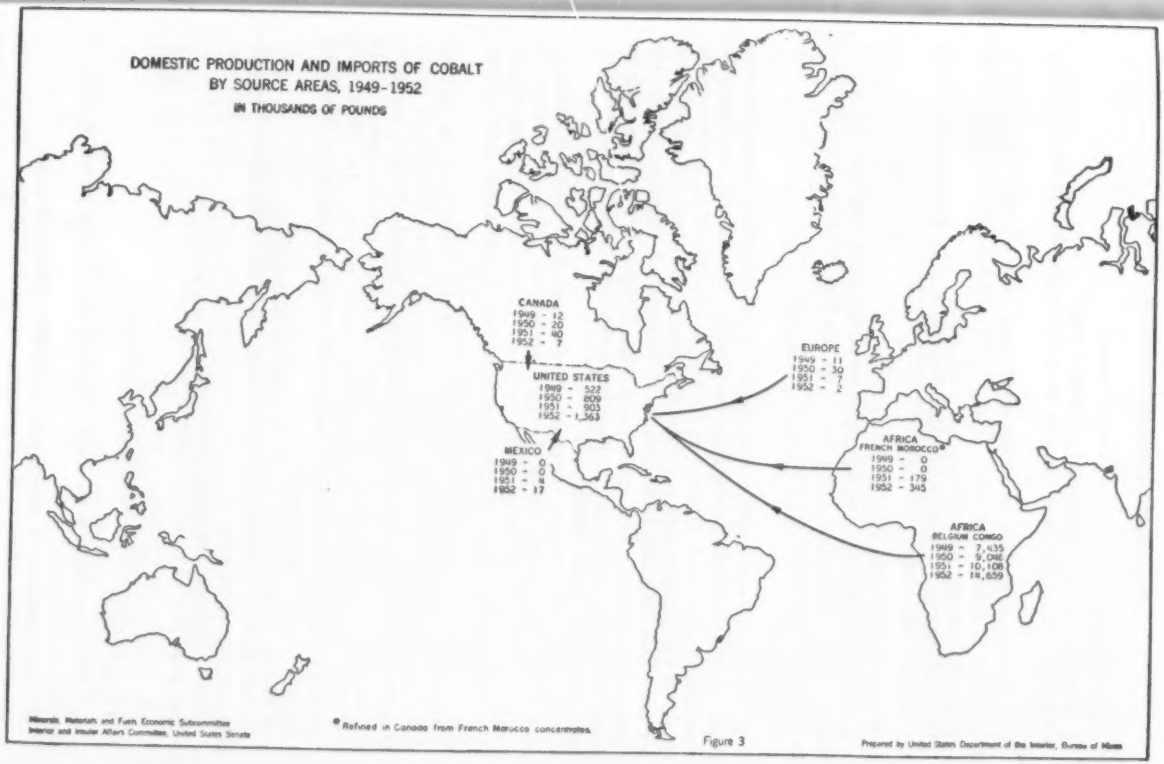

DOMESTIC PRODUCTION AND IMPORTS OF COBALT
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF POUNDS
CANADA
1949 - 12
1950 - 20
1951 - 40
1952 - 7
UNITED STATES
1949 - 522
1950 - 809
1951 - 903
1952 - 1,363
MEXICO
1949 - 0
1950 - 0
1951 - 14
1952 - 17
EUROPE
1949 - 11
1950 - 30
1951 - 7
1952 - 2
AFRICA
FRENCH MOROCCO*
1949 - 0
1950 - 0
1951 - 179
1952 - 345
AFRICA
BELGIUM CONGO
1949 - 7,435
1950 - 9,048
1951 - 10,108
1952 - 14,659
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
* Refined in Canada from French Morocco concentrates.
Prepared by United States Department of the Interior, Bureau of Mines

Figure 3

COLUMBIUM-TANTALUM

1. United States

Production: A few thousand pounds a year.

Consumption: 1 million pounds of combined columbium-tantalum metal.

Columbium-tantalum minerals are mined in the United States as a byproduct of other minerals. The United States produces less than 1 percent of its requirements.

In 1953, nearly 80 percent of this country's total supply came from Nigeria and the Belgian Congo.

2. Western Hemisphere

Although large reserves of high-grade tantalite ore are known in Brazil, total production from the Western Hemisphere is inadequate to meet our demands.

3. Comments

Titanium is a satisfactory substitute for columbium in some stainless steels but is not as acceptable for many specialized applications. Columbium has been conserved by the development of a low-carbon steel, which requires less columbium. Zirconium can be substituted for tantalum in some instances as a material of construction in the chemical industry. For specialized high-temperature alloys and for many electronic applications, no adequate substitutes for columbium-tantalum have been developed.

Important placer deposits of columbite-tantalite have been discovered in the United States in the last few years. Probably other deposits would be found if a search is made. Government aid for exploration is available from the Defense Minerals Exploration Administration.

Improved metallurgical processes must be developed to extract these metals from their ores and to separate them from each other. At present, tantalum is in shorter supply than columbium, yet only the tantalum contained in high-grade tantalite concentrates can be extracted economically by processes now in use. In 1953, this represented 250,000 pounds of tantalum metal compared with a total supply of 1.5 million pounds.

Western Hemisphere: Can become self-sufficient.

Substitutes: Titanium and zirconium for some uses, none for high-temperature alloy uses.

Uses: High-temperature alloy uses.

See page 204 of hearings, part 1, for details.

COPPER

1. United States

(*a*) *Mine production in 1953:* 925,000 short tons or more than 30 percent of the world total.

(*b*) *Consumption of new copper in 1953:* 1,435,000 tons.

(*c*) *Present position.*—New projects under the Defense Production Act have been or will be brought into production. The output from these properties will be 250,000 tons annually. Known reserves can support production at the current rate for 25 years. Continued discoveries and improved techniques in mining and metallurgy can be counted on to extend this time.

SUPPLIES AND CONSUMPTION OF COPPER
AVERAGE PRICE IN CENTS PER POUND
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
1947
U.S.-67%
South America 21%
Mexico 6%
Canada-2%
Other-2%
Africa-1%
Cuba-1%
1952
U.S.-60%
South America 25%
Canada 5%
Africa-3%
Mexico-3%
Other-3%
Cuba-1%
THOUSANDS OF SHORT TONS-COPPER
CENTS PER POUND-COPPER
2000
1600
1200
800
400
0
25
20
15
10
5
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
* Preliminary figures
Quoted price in 1942 thru 1947 includes weighted average bonus payments made to high cost domestic mines.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

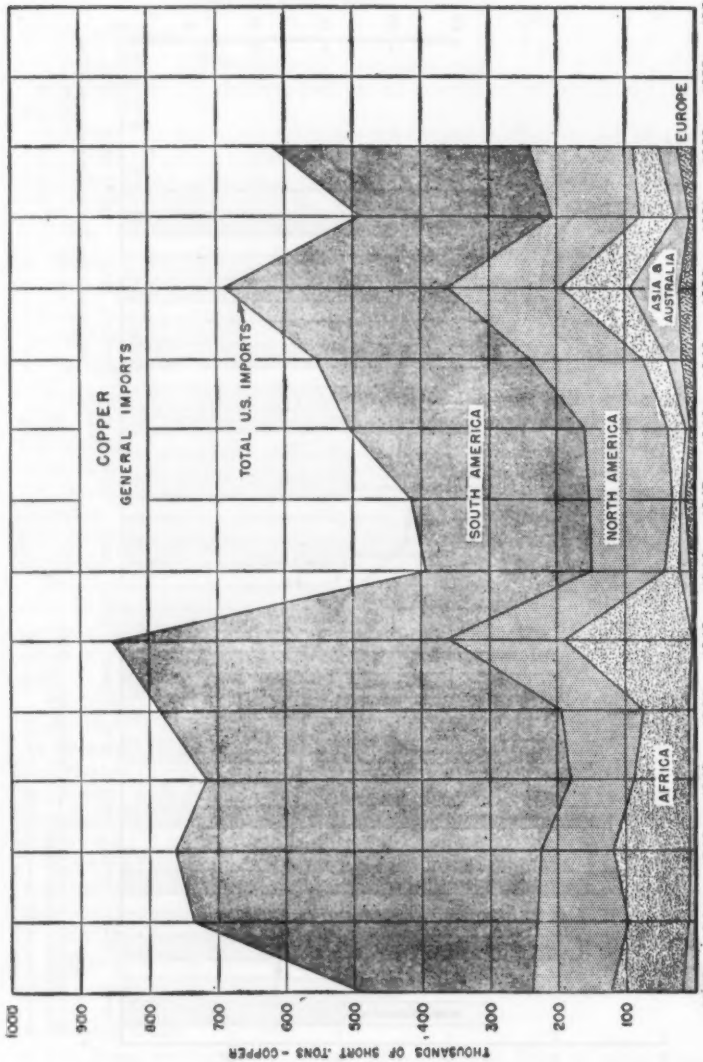

COPPER
GENERAL IMPORTS
TOTAL U.S. IMPORTS
SOUTH AMERICA
NORTH AMERICA
ASIA & AUSTRALIA
EUROPE
AFRICA
THOUSANDS OF SHORT TONS - COPPER
1000
900
800
700
600
500
400
300
200
100
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

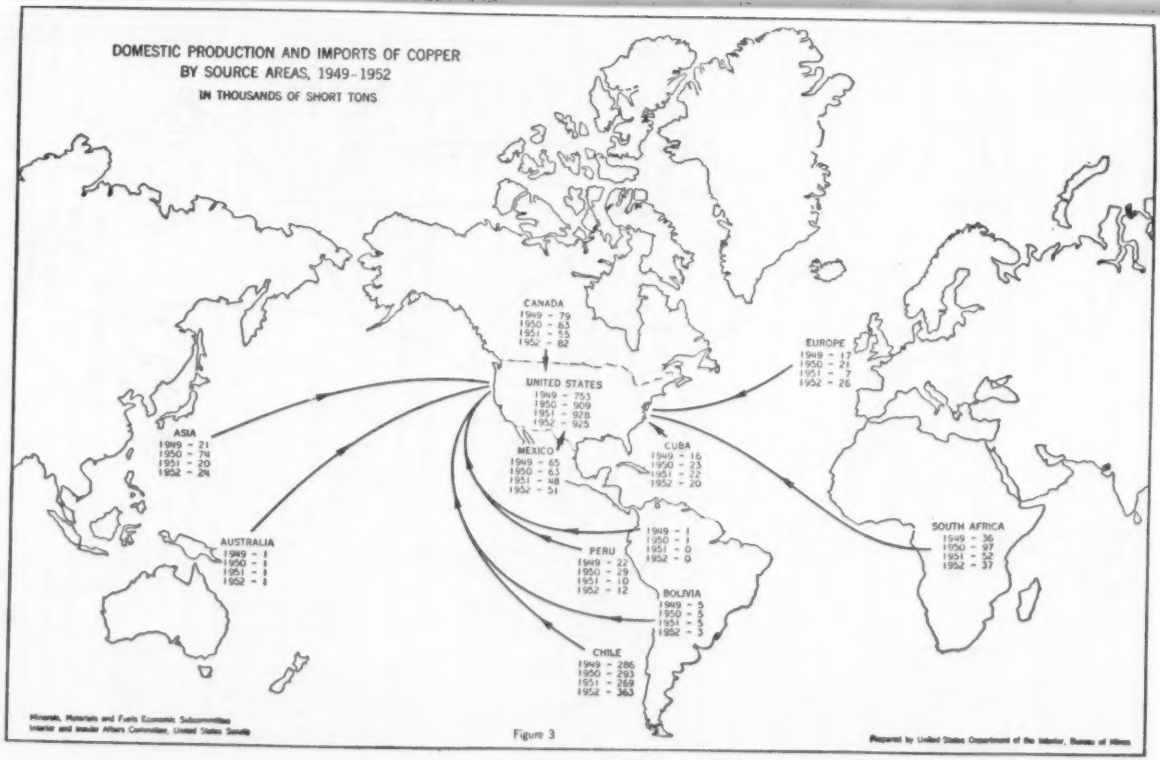
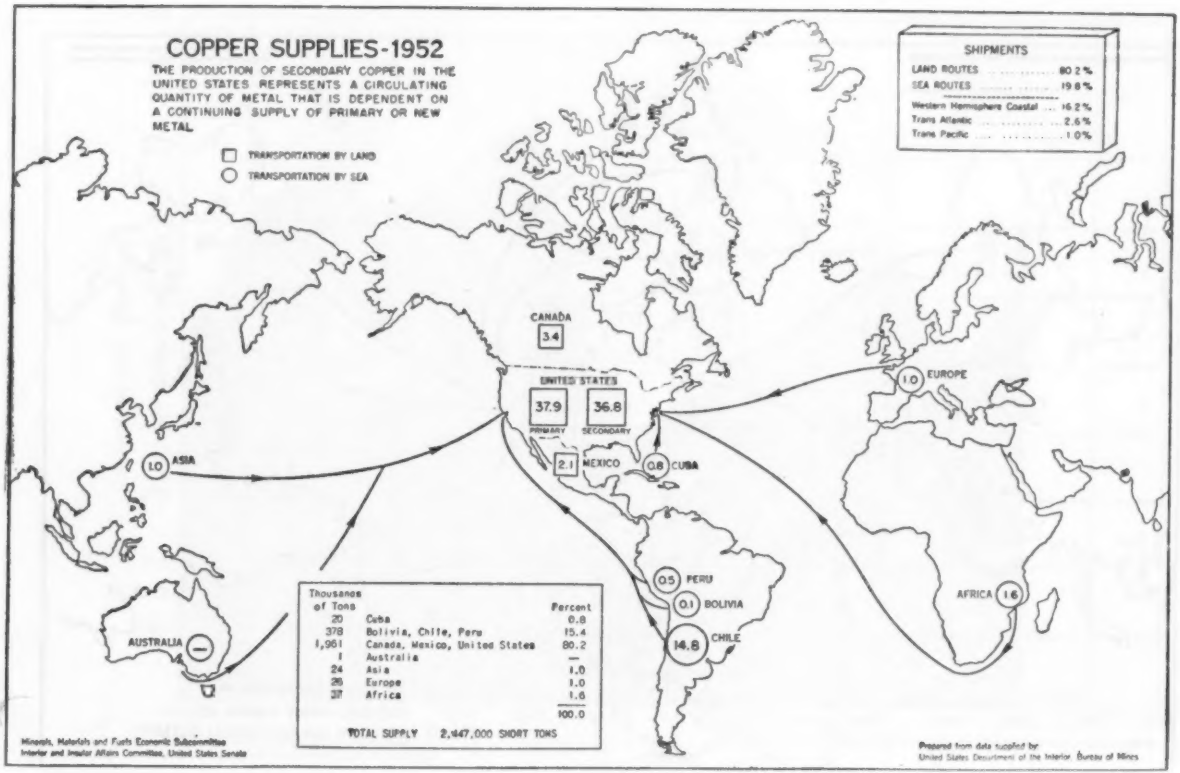

DOMESTIC PRODUCTION AND IMPORTS OF COPPER
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF SHORT TONS
CANADA
1949 - 79
1950 - 83
1951 - 75
1952 - 82
UNITED STATES
1949 - 753
1950 - 909
1951 - 928
1952 - 925
EUROPE
1949 - 17
1950 - 21
1951 - 7
1952 - 26
ASIA
1949 - 21
1950 - 74
1951 - 20
1952 - 24
MEXICO
1949 - 65
1950 - 63
1951 - 48
1952 - 51
CUBA
1949 - 16
1950 - 23
1951 - 22
1952 - 20
SOUTH AFRICA
1949 - 36
1950 - 97
1951 - 52
1952 - 37
AUSTRALIA
1949 - 1
1950 - 1
1951 - 1
1952 - 1
1949 - 1
1950 - 1
1951 - 0
1952 - 0
PERU
1949 - 22
1950 - 29
1951 - 10
1952 - 12
BOLIVIA
1949 - 5
1950 - 5
1951 - 5
1952 - 3
CHILE
1949 - 286
1950 - 293
1951 - 269
1952 - 363
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 3


COPPER SUPPLIES-1952
THE PRODUCTION OF SECONDARY COPPER IN THE UNITED STATES REPRESENTS A CIRCULATING QUANTITY OF METAL THAT IS DEPENDENT ON A CONTINUING SUPPLY OF PRIMARY OR NEW METAL
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 80.2%
SEA ROUTES 19.8%
Western Hemisphere Coastal 16.2%
Trans Atlantic 2.6%
Trans Pacific 1.0%
CANADA 3.4
UNITED STATES
37.9 PRIMARY
36.8 SECONDARY
2.1 MEXICO
0.8 CUBA
1.0 EUROPE
1.0 ASIA
AUSTRALIA —
0.5 PERU
0.1 BOLIVIA
14.8 CHILE
AFRICA 1.6
Thousands of Tons | | Percent
20 Cuba 0.8
378 Bolivia, Chile, Peru 15.4
1,961 Canada, Mexico, United States 80.2
1 Australia —
24 Asia 1.0
26 Europe 1.0
37 Africa 1.6
100.0
TOTAL SUPPLY 2,447,000 SHORT TONS
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by
United States Department of the Interior, Bureau of Mines

2. Western Hemisphere

(*a*) *Production.*—In 1952: 1,750,000 tons or 58 percent of the world total. Chile and Peru contributed 16 percent of this amount.

The Western Hemisphere is more than self-sufficient.

3. Sources outside the Western Hemisphere

Africa is second to the United States and produced 21 percent of the world total supply in 1952. Almost all African copper is consumed in Europe, but exports to the United States are increasing.

4. Comments

More than 85 percent of the copper produced in the United States is from very large operations having a high technical efficiency which has enabled the domestic producers to meet foreign competition even though wages, supplies, and taxes here are the highest in the world. The competition is getting sharper, however, as the average grade of ore is less than 1 percent as compared to 2 percent in Chile and as high as 2 to 6 percent in Africa coupled with vastly lower operating costs.

Nearly one-third of the United States consumption of newly mined copper has come from abroad in recent years. Of the apparent consumption of new copper in 1953, 35 percent was imported compared with an annual average of 30 percent in 1950 to 1952, inclusive.

Known reserves would support production at the current rate for over 25 years, and these reserves will be greatly extended by improved techniques of discovery, mining, and recovery, or other stimuli. Eighty-seven percent of United States production in 1952 came from eight leading districts.

Promising new areas in the United States have been or are to be brought into production under Defense Production Act stimulation. The peak annual output of these properties is expected to be about 250,000 tons.

Occurrences of copper in important world sources are more concentrated even than in the United States, in from one o not more than a few large properties.

Aluminum is the most common substitute for copper and the only noteworthy substitute in consumption for electrical purposes, copper's chief use. Clad metals, other alloys, plastics, and other products may be used to conserve copper in some of its other applications.

Outside of the United States, Canada is the only important copper-consuming nation in the Western Hemisphere; although industrial use of copper has made noteworthy gains in Canada in recent years, the tonnage consumed is only one-tenth of that in the United States.

Most of the copper produced in the world comes from large mines which have been brought to production only through substantial expenditure of money and time. World supplies usually cover requirements, but fall short in times of suddenly and sharply expanded demand, as in a widespread war. Because of the great size of most operations, production cannot be increased quickly; sharply increased demand in an emergency has to be accompanied by artificially curtailed consumption (allocation). To solve the problems outlined, the following are needed:

Methods by which sharply increased, emergency demand may be met. Government stockpiles.

Continued exploration to increase the knowledge of areas favorable for production.

Continued study of improved techniques for discovery, mining, and recovery of copper.

Increased knowledge concerning methods of conserving supplies, through substitution and other means.

Western Hemisphere: Self-sufficient.

Substitutes: Principally aluminum.

Uses: Electrical wire and equipment, alloys.

See page 153 of hearings, part 1, for details.

CORUNDUM

1. United States

The United States depends upon foreign sources for its entire supply of corundum.

Exact consumption statistics are not available, but in recent years imports of corundum into the United States have ranged between 2,000 and 5,000 tons annually.

No corundum is being produced in the United States.

2. Western Hemisphere

In recent years the corundum output of the Western Hemisphere as a whole has been negligible. Little attempt has been made to increase production.

3. Comments

Fused alumina is widely used as a corundum substitute, and it is only in certain specialized uses, such as lens grinding, that corundum is currently considered indispensable. Even in these special applications, the indispensability of corundum is being challenged.

In an emergency the self-sufficiency of the Western Hemisphere could be improved through the development of deposits in Canada and elsewhere. The known deposits, however, are considered to be relatively low grade and, therefore, more satisfactory and permanent solutions might be sought through further research on substitutes.

A comprehensive research program embodying the development of adequate substitutes, and the accumulation of reliable information on the abrasive properties of a variety of prospective substitutes can be expected, over a period of years, to make major contributions to the solution of this supply problem.

Western Hemisphere: Canada possible source.

Substitutes: Fused alumina and other materials; a high degree of substitution is practical and further investigation is expected to prove that corundum can be replaced entirely.

Uses: Polishing lenses.

See page 282, hearings, part 1, for details.

DIAMONDS, INDUSTRIAL

1. United States

The United States depends entirely upon foreign sources for its supply of industrial diamonds.

The United States is the world's largest consumer of diamonds. It is estimated that our consumption in 1952 totaled 10,800,000 carats, and the trend is upward.

At present no diamonds are produced in this country, and there is no prospect of developing production capacity in the future.

2. Western Hemisphere

Industrial diamonds are produced in a number of South American countries, but the Western Hemisphere output is only about 1 percent of world total, and little attempt has been made to increase it.

3. Comments

The United States can reduce its dependence upon foreign sources of diamonds by increasing the efficiency of grinding and drilling practice, recovery and reuse of diamond-bearing grinding sludges, the development of alternate grinding methods that require little or no diamonds, and ultimately by synthesis of the diamond itself.

Research is being conducted on projects designed to contribute to the eventual solution of this problem, and intensification of this research almost certainly would greatly improve the supply position of the United States.

Western Hemisphere: Not self-sufficient, but use can be reduced by half through substitutes.

Substitutes: Other grinding methods, salvage of sludge.

Uses: Dies for wire drawing, polishing, core drills.

See page 290, hearings, part 1, for details.

FLUORSPAR

1. United States

(*a*) *Production.*—Production in 1952 was 345,000 short tons and slightly less in 1953. A high production of 420,000 tons was reached in 1944.

(*a*) *Consumption.*—Consumption in 1952 was 521,000 tons and close to 600,000 tons in 1953.

(*b*) *Present position.*—Domestic production is supplying only about two-thirds of consumption and this percentage is steadily decreasing due to foreign low-wage competition.

3. Western Hemisphere

(*a*) The Western Hemisphere can be entirely self-sufficient. The total output of the Western Hemisphere is estimated at 650,000 tons for 1952, with Mexico supplying almost 26 percent of imports and Canada almost 3 percent. Both countries have exportable surpluses, most of which is shipped to the United States. Recent discoveries of deposits in Mexico near the American border give promise of making a substantial contribution to the supply of the United States.

4. Sources outside the Western Hemisphere

In 1952 22 percent was imported from the European and Mediterannean region. In time of war production as well as transportation would be highly vulnerable.

5. Comments

No satisfactory substitutes have been found for fluorspar and fluorine compounds for most of their uses.

The position of the Western Hemisphere can be improved through exploration for additional deposits of fluorspar, study of ways to utilize lower grades, and continued research on the production of synthetic

metallurgical-grade fluorspar from fluorine recovered from phosphate rock. The Tennessee Valley Authority has made some progress in this direction.

The little publicized fluorine compounds, of which fluorite (commonly known as fluorspar) is the key fluorine mineral, play an important role in war as well as in peace. Fluorine compounds are used in preparing uranium isotopes. America's air power depends upon the production of aluminum, which would be crippled without two fluorine chemicals—aluminum fluoride and sodium-aluminum fluoride (cryolite). Hydrofluoric acid is employed as a catalyst for producing high-octane aviation-fuel blends and as a raw material in manufacturing Freon refrigerants. The importance of fluorspar in the manufacture of basic open-hearth and basic-electric steels is well recognized.

The United States is the largest consumer of fluorspar in the world, but production is steadily declining as domestic producers cannot compete on a fair and reasonable basis with low-wage countries. For example, a maximum of $1 a day is paid in Mexico as compared to $12 to $14 per day in Illinois and Kentucky. In 1952 over half of our requirement was imported. Mexico is by far the largest supplier of foreign fluorspar. Germany, Spain, Canada, and France also have supplied large quantities.

RESEARCH

The Tennessee Valley Authority has made much progress toward the production of a synthetic metallurgical-grade fluorspar from fluorine recovered from phosphate rock.

OUTLOOK FOR PRODUCTION IN THE UNITED STATES

To make the United States less dependent on foreign sources for its supply of fluorspar, a vigorous exploration program is warranted, coupled with a study of utilization of lower grade deposits. Research and development of methods of recovering fluorine from phosphate rock, now underway, should be intensified, and research to develop a satisfactory and economical flux for the manufacture of steel, with less or without fluorspar as a base, should be undertaken.

WESTERN HEMISPHERE POSITION

Western Hemisphere countries except the United States have only small requirements, which are met by local production or small imports. Mexico and Canada have exportable surpluses.

Operations in Mexico and Canada are being expanded, and additional supplies from these sources are being made available to the United States. The only known commercial deposit of cryolite is at Ivigtut, Greenland.

Substitutes: None that are satisfactory.

Uses: Flux in basic open-hearth and basic-electric steels, very important in manufacture of aluminum, refrigerants, and many chemicals also essential in operation of gaseous diffusion process to obtain uranium isotopes at Oak Ridge, Tenn.

See page 290, hearings, part 1, for details.

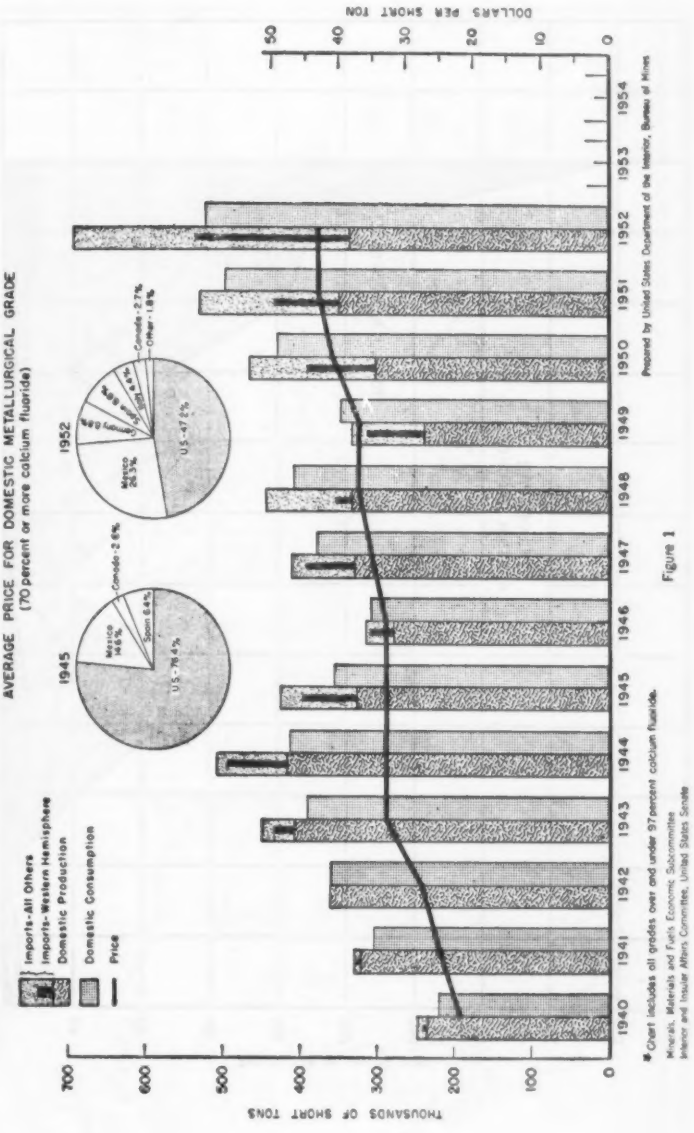

SUPPLIES AND CONSUMPTION OF FLUORSPAR*
AVERAGE PRICE FOR DOMESTIC METALLURGICAL GRADE
(70 percent or more calcium fluoride)
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
1945
Mexico 16%
Spain 64%
Canada-3.6%
U.S.-76.4%
1952
Mexico 28.3%
U.S.-47.2%
Canada-2.7%
Other-1.8%
THOUSANDS OF SHORT TONS
DOLLARS PER SHORT TON
1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954
Prepared by United States Department of the Interior, Bureau of Mines
*Chart includes all grades over and under 97 percent calcium fluoride.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 1

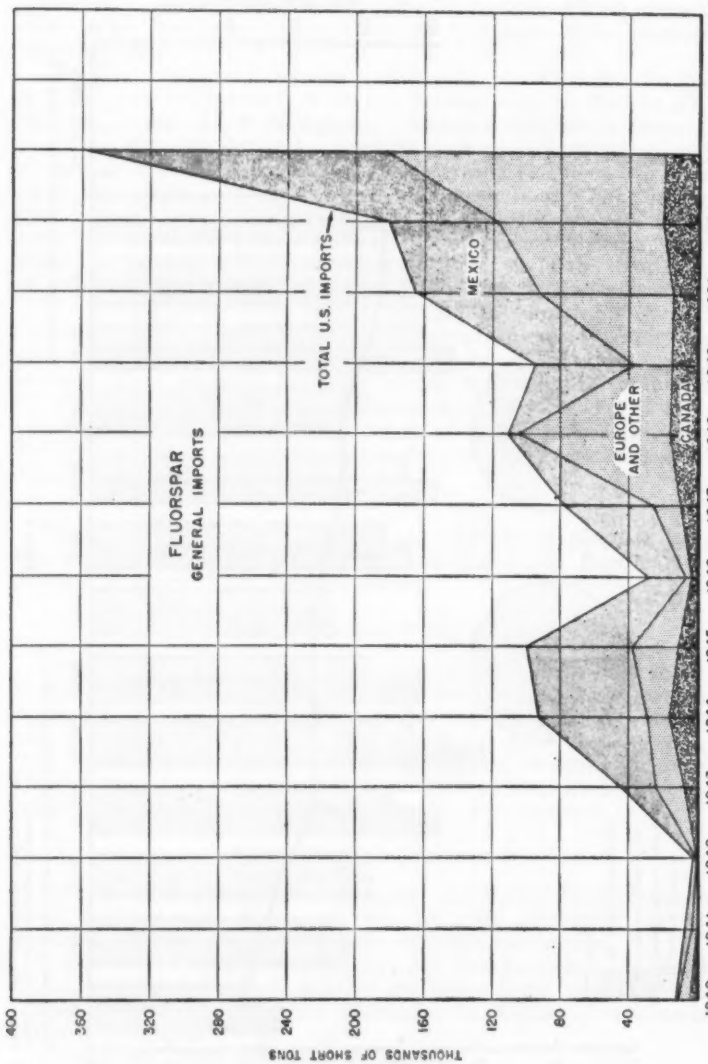
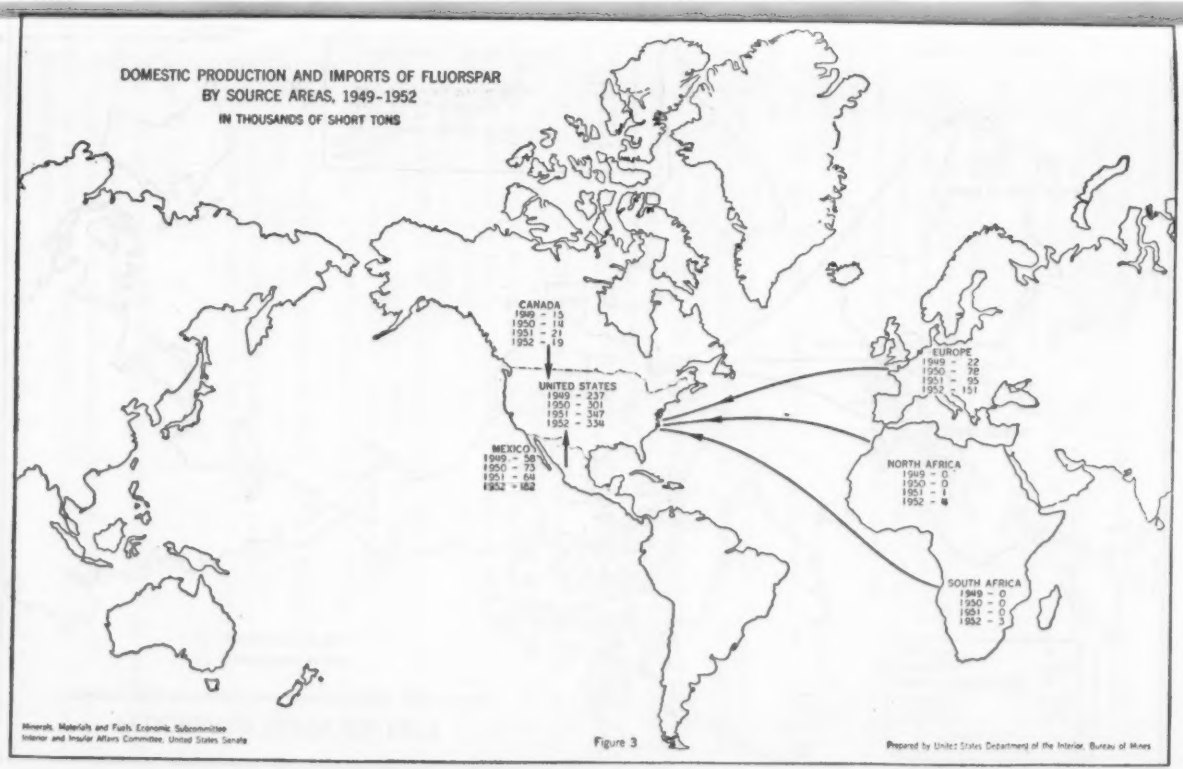

FLUORSPAR
GENERAL IMPORTS
TOTAL U.S. IMPORTS
MEXICO
EUROPE AND OTHER
CANADA
THOUSANDS OF SHORT TONS
400
360
320
280
240
200
160
120
80
40
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

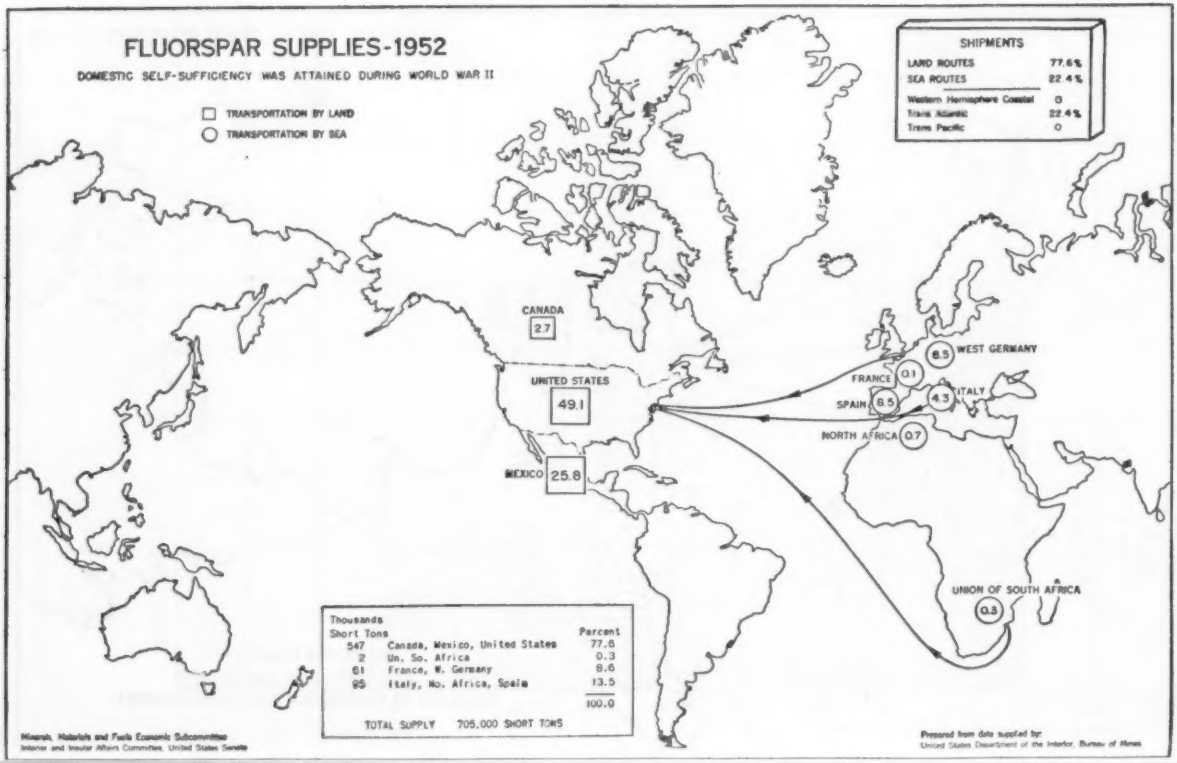
Prepared by United States Department of the Interior, Bureau of Mines



Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 3

Prepared by United States Department of the Interior, Bureau of Mines


FLUORSPAR SUPPLIES-1952
DOMESTIC SELF-SUFFICIENCY WAS ATTAINED DURING WORLD WAR II
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 77.6%
SEA ROUTES 22.4%
Western Hemisphere Coastal 0
Trans Atlantic 22.4%
Trans Pacific 0
CANADA 2.7
UNITED STATES 49.1
MEXICO 25.8
WEST GERMANY 8.5
FRANCE 0.1
SPAIN 8.5
ITALY 4.3
NORTH AFRICA 0.7
UNION OF SOUTH AFRICA 0.3
Thousands Short Tons
547 Canada, Mexico, United States 77.6
2 Un. So. Africa 0.3
61 France, W. Germany 8.6
95 Italy, No. Africa, Spain 13.5
100.0
TOTAL SUPPLY 705,000 SHORT TONS
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by
United States Department of the Interior, Bureau of Mines

GRAPHITE

1. United States

The estimated average annual consumption of strategic graphite in the United States is 7,500 short tons.

United States production in 1952 was about one-fourth of the estimated consumption, but virtually all of it was sold to the Government for the national stockpile at a price competitive with foreign imports.

2. Western Hemisphere

Western Hemisphere production of strategic graphite (exclusive of the United States output purchased for the stockpile) in 1952 was 1,842 short tons, partly from Canada. The Canadian mine was reported to be permanently closed early in 1954 due to exhaustion of available ore reserves.

3. Comments

There are no known substitutes or replacements for strategic graphite.

The United States can become self-sufficient within its continental boundaries in strategic graphite by utilizing lower grade domestic ores which are in ample reserve.

From information available it appears that the only going-concern primary source of strategic graphite in the Western Hemisphere is in Texas. The company operating the property can supply 25 percent of current requirements and can supply up to 50 percent with added facilities.

Research over a period of some years has resulted in the production of material that will meet stockpile specifications at a price well in line with imports from Madagascar and Ceylon.

Proper policies by the Government to keep this plant in operation in the interest of national safety and security would act as a brake on exorbitant foreign prices.

There are deposits in Pennsylvania and Alabama, but they have not been developed to the same extent as the one in Texas.

Research is needed to develop more efficient mining and beneficiating methods for recovering flake graphite from low-grade domestic ores.

Western Hemisphere: Can be self-sufficient in United States.

Substitutes: None.

Uses: Crucibles, retorts, lubricants, carbon brushes.

See page 264, hearings, part 1, for details.

IODINE

1. United States

The United States now obtains approximately half its supply of iodine from foreign sources.

It is estimated that annual consumption of iodine in the United States in recent years has ranged from about 1,200,000 to about 1,500,000 pounds.

Exact production statistics for the United States are not published.

2. Western Hemisphere

Iodine output in Chile generally ranges from 1 to 3 million pounds per year and Chilean producers have indicated that substantially greater quantities can be recovered if required.

3. Comments

Although iodine is either essential or the overwhelmingly preferred chemical in most of its uses, in extreme conditions substitutes, such as other antiseptics and reduction of consumption in such applications as iodized salt and stock feeds, could alleviate an emergency situation.

As Chile is the largest producer of iodine in the world and the United States also has a large output, the Western Hemisphere is self-sufficient in this material. A special problem involved is the fact that in Chile iodine is a byproduct of nitrate production and therefore the supply is dependent upon continued production of nitrate in that country.

Western Hemisphere: Self-sufficient.

Substitutes: None for metallurgical uses, several for medical antiseptics.

Uses: Medical and metallurgical.

See page 279, hearings, part 1, for details.

IRON ORE

1. United States

(*a*) *Production.*—In 1953 the domestic production of iron ore is estimated at 119 million tons. It was 116 million tons in 1951 and 98 million tons in 1952.

The United States is in an exceptionally favorable position in regard to iron ore. While there is an increasing tendency to go overseas for higher grade and more cheaply produced ores, it does not mean that the United States is running out of iron ore. There are deposits of good grade ores in many parts of the country, in addition to the great Lake Superior deposits. Several hundred millions of dollars have already been invested in the development of taconite deposits in the Lake Superior area of which there are enormous reserves.

2. Western Hemisphere

The Western Hemisphere is entirely self-sufficient in iron ore.

There have been a number of discoveries of very large high-grade deposits of iron ore in Canada in recent years and two new projects are in operation in Venezuela.

3. Comments

The establishment of steel plants on the eastern seaboard is an important factor in iron-ore imports.

During 1952, 10 percent of the iron ore supply was imported from overseas sources and probably will be as high as 20 percent by 1955.

Imports, however, will increase from Canada and Venezuela as the trend toward further decentralization of the steel industry continues.

Western Hemisphere: Self-sufficient.

Substitutes: None that are significant.

Uses: Steel.

See page 66, hearings, part 1, for details.

JEWEL BEARINGS

1. United States

The United States is about 14 percent self-sufficient in jewel-bearings production. Switzerland is the leading producer. Practically all jewel bearings are made from synthetic sapphire and ruby (varieties of corundum) which are produced from domestic raw materials in plentiful supply.

A total of 77,312,000 finished jewels was consumed in the United States in 1952.

A total of 10,637,000 finished jewels was produced in the United States in 1952.

2. Western Hemisphere

The United States is the only country in the Western Hemisphere that has any significant production of jewel bearings.

3. Comments

No substitutes have been found for synthetic corundum jewel bearings. Synthetic spinel and glass are used to a limited degree for applications where maximum hardness is not required.

Research programs for jewel bearings should be directed toward increased mechanization of jewel-bearings production techniques and standardization and reduction in the number of sizes and styles used for industrial and military equipment.

The problems of the jewel-bearings industry of paramount importance are the impracticability of establishing realistic stockpile objectives for the vast number of sizes and styles now being used, and the difficulty of maintaining a manufacturing industry in the United States against the competition of the well-established Swiss industry. A small domestic industry now is subsidized to provide a nucleus of facilities and trained personnel, in order that the domestic industry may be expanded in an emergency.

Western Hemisphere: Can be self-sufficient in the United States if necessary.

Substitutes: Synthetic minerals already are used in place of natural minerals.

Uses: Precision instrument bearings.

See page 258, hearings, part 1, for details.

KYANITE (STRATEGIC)

There is no United States or Western Hemisphere production of strategic kyanite.

Estimated annual consumption of strategic kyanite and synthetic mullite suitable for making high-grade mullite refractories is 30,000 to 40,000 short tons.

Research by Government and private concerns has resulted in the development of synthetic mullite products equal or superior to those derived from high-grade Indian kyanite at a cost no higher than that for the imported material. In view of assurance that acceptable mullite can be produced synthetically from Western Hemisphere sources, the United States can be considered self-sufficient in mullite forming raw materials.

Even though self-sufficiency has been achieved by the development of synthetic mullite, investigation of domestic deposits to determine their extent and suitability for synthetic mullite refractory manufacture should be conducted.

Western Hemisphere: Self-sufficient in substitutes.

Substitutes: Already in use.

Uses: Refractories.

See page 260, hearings, part 1, for details.

LEAD

1. United States.

(*a*) *Production.*—Domestic production of lead for 1953 was 335,000 tons as against 390,000 tons in 1952 due to a decline in price.

(*b*) *Consumption.*—In 1953 consumption was 1,180,000 tons. Total supply of all forms of lead averaged 1,314,000 tons annually for the 1948–52 period and consisted of domestic mine production (402,000 tons), secondary recovery (477,000 tons), and imports (435,000 tons).

2. Western Hemisphere

(*a*) Canada and Mexico are the chief sources of imports, accounting for almost 23 percent of the total supply. The Western Hemisphere is entirely self-sufficient and accounted for practically one-half the total world supply in 1952.

3. Comments

(*a*) The domestic producers are subject to either a feast or a famine. The latter situation has prevailed since about the middle of 1952. Many mines have been shut down, and a number of large ones are being operated at a break-even point or a direct loss to avoid a greater loss if shut down completely.

In times of emergency and shortage imports are in short supply; when the emergency is over, as was the case recently, imports flood the market and drive the price down. The industry is deprived of protection under the Trade Agreements Act of 1934.

The most significant development in the United States lead industry since 1936 has been the transition from self-sufficiency to a situation where imports constitute almost one-third of total supply. Imports were relatively unimportant until 1940, when it became apparent that domestic mine production and secondary output would be unable to supply the greatly increased demand for lead.

Domestic ore reserves of lead and their distribution are such that American industry could produce at the rate of about 400,000 tons per annum, given a moderate improvement in the present price cost ratio.

The current depressed price of both lead and zinc has already closed many mines in the United States and will lead to economic dislocations and a shortage of lead supplies in the future.

SECONDARY PRODUCTION

Since 1946 secondary production has exceeded domestic mine production and has been the most important single source of supply. Secondary production during resent years has represented 40 percent of total supply.

WESTERN HEMISPHERE POSITION

The United States, Mexico, and Canada (first, second and fourth in world mine production of lead) produced over 64 percent of the total world lead output in 1951.

North American reserves exclusive of the United States are estimated at 5 million tons. Canada has by far the largest portion of these reserves, chiefly in British Columbia, Newfoundland, and New Brunswick where an important development is underway.

SUPPLIES AND CONSUMPTION OF LEAD*
AVERAGE PRICE IN CENTS PER POUND

SUPPLIES AND CONSUMPTION OF LEAD*
AVERAGE PRICE IN CENTS PER POUND

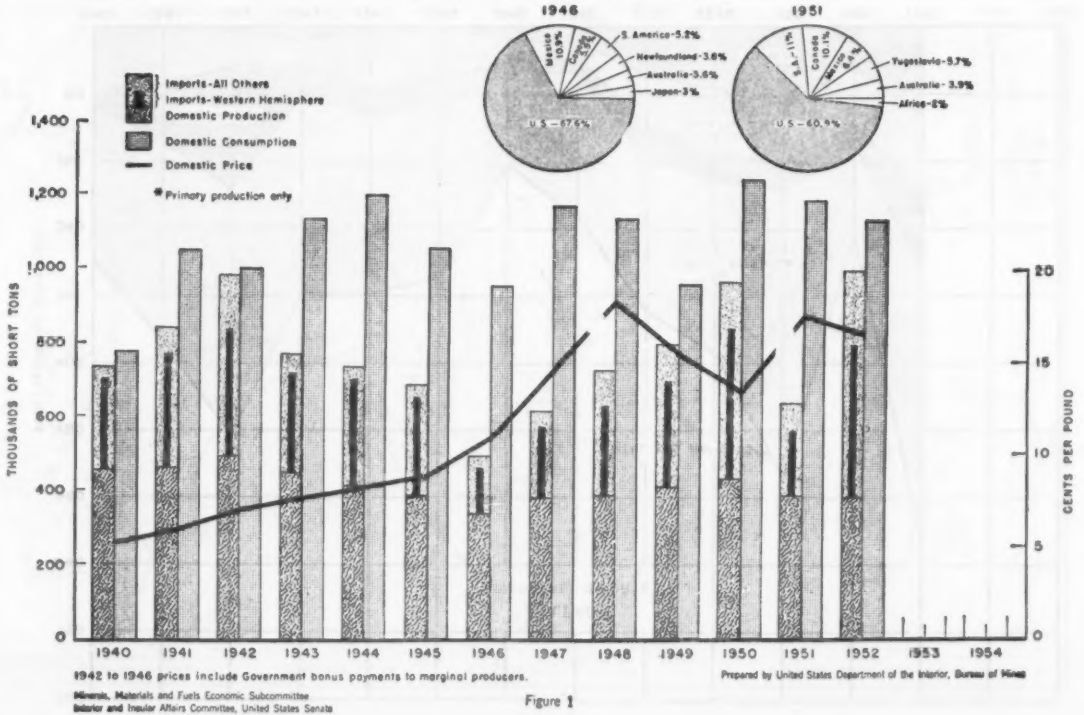


Figure 1

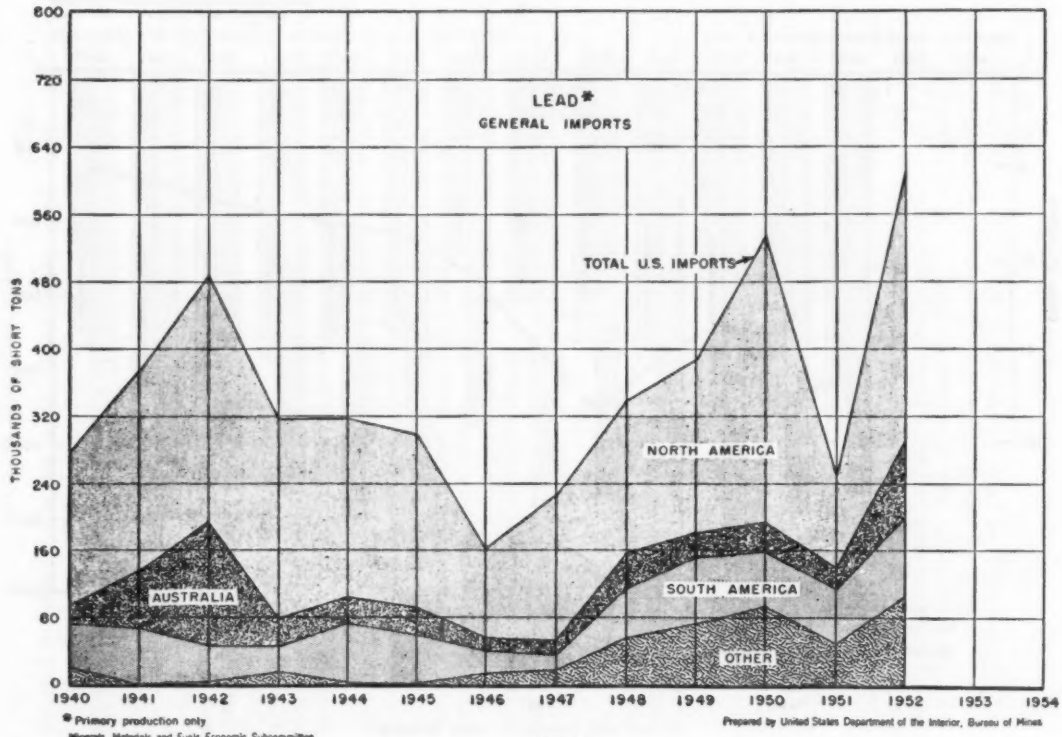

LEAD*
GENERAL IMPORTS
THOUSANDS OF SHORT TONS
800
720
640
560
480
400
320
240
160
80
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
TOTAL U.S. IMPORTS
NORTH AMERICA
SOUTH AMERICA
AUSTRALIA
OTHER
* Primary production only
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

DOMESTIC PRODUCTION AND IMPORTS OF LEAD*

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

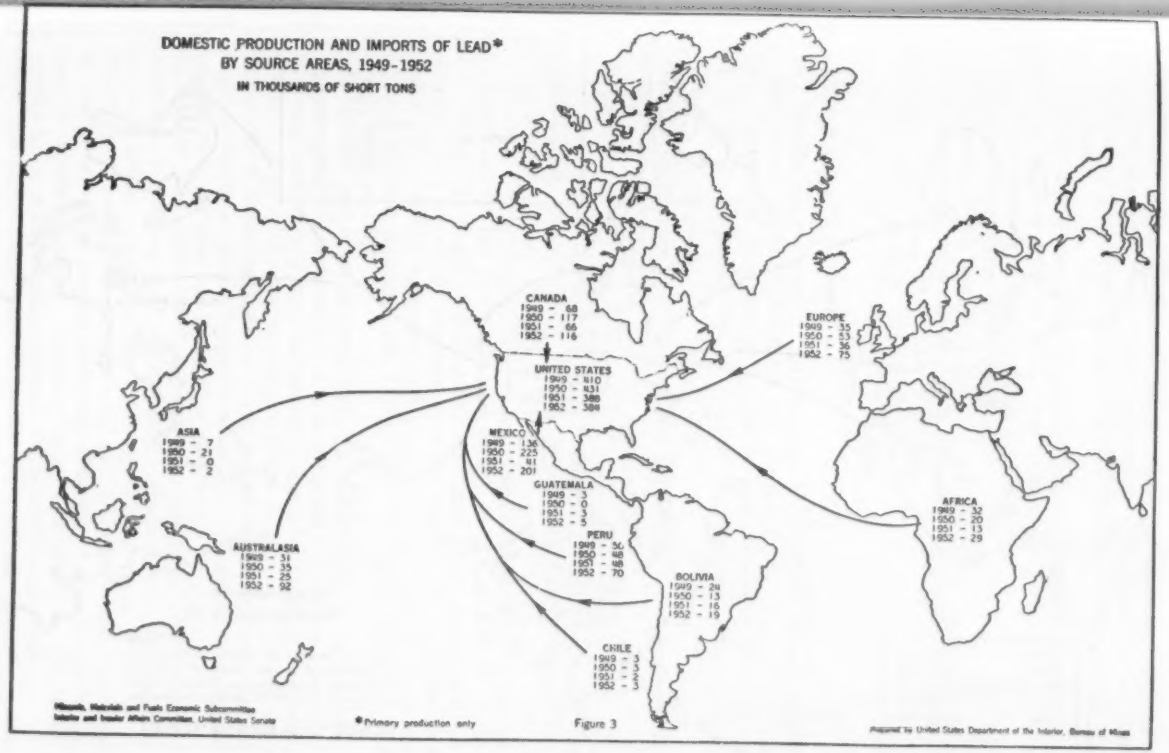


Figure 3

LEAD SUPPLIES-1952
THE PRODUCTION OF SECONDARY LEAD IN THE UNITED STATES REPPESENTS A CIRCULATING QUANTITY OF METAL THAT IS DEPENDENT ON A CONTINUING SUPPLY OF PRIMARY OR NEW METAL
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 78.7%
SEA ROUTES 21.3%
Western Hem.sphere Coastal 6.8%
Trans Atlantic 7.6%
Trans Pacific 6.9%
CANADA 8.5
UNITED STATES 27.6 28.4 OF WHICH SECONDARY
MEXICO 14.2
GUATEMALA .3
PERU .50
BOLIVIA 1.5
CHILE .02
EUROPE 1.5
YUGOSLAVIA 1.9
AFRICA 2.2
PHILIPPINE ISLANDS .02
AUSTRALIA .67
Thousands of Tons
5 Guatemala
92 Bolivia, Chile, Peru
1,101 Canada, Mexico, United States
2 Philippines
21 Europe
29 Africa
54 Yugoslavia
62 Australia
Percent
.3
5.5
78.7
0.2
1.5
2.2
3.9
6.7
100.0
TOTAL SUPPLY 1,360,000 SHORT TONS
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee United States Senate
Prepared from data supplied by United States Department of the Interior, Bureau of Mines

Peru is the largest lead producer in South America accounting for over half of the total South American output. The country has been incompletely explored and the possibility of finding additional reserves are excellent.

Currently known ore reserves in the Western Hemisphere will yield almost 15 million tons of lead. As with zinc, it is believed the potential for additional discoveries is excellent.

Western Hemisphere: Self-sufficient.

Substitutes: None needed.

Uses: Batteries, type metal, cable covering, antiknock fuel, paint pigments.

See page 165, hearings, part 1, for details.

LITHIUM

1. United States

(*a*) *Production.*—Domestic shipments of lithium ores averaged during the 1943–47 period 5,885 short tons containing 421 tons of lithium oxide. Shipments increased to 15,600 tons containing 1,088 tons of oxide in 1952. The estimated production for 1954 is 20,000.

2. Western Hemisphere

There are no reports of lithium ore production elsewhere in the Western Hemisphere.

3. Comments

Small production is reported from Portuguese East Africa and the Belgian Congo. No shipments to the United States are reported from these sources.

Lithium is the lightest of the known metallic elements. Although discovered nearly 150 years ago and widely distributed in the rocks and waters of the earth, it was little known and little used only a few years ago. An excellent example of what can be accomplished by research, the various minerals and compounds of lithium now are produced in large tonnages and have scores of important uses; the list is growing rapidly.

Lithium is used in its mineral form, in metal form, or in the form of various lithium compounds. Its long list of applications includes lubricants, ceramics, glass, metallurgy, air conditioning, welding, medicinals, dry cells, and alkaline storage batteries. Its military uses include lithium hydride as a carrier of hydrogen for inflating signal balloons and, as the hydroxide, as a carbon dioxide absorbent in submarines. It also has thermonuclear uses.

The three most important sources of lithium are the minerals spodumene, lepidolite, and amblygonite, which are only recovered from pegmatites.

The bulk of the spodumene produced in the United States has come from the Black Hills district of South Dakota. Other deposits are known in North Carolina. Another important source is the brines of Searles Lake in California, where it is a byproduct mineral.

There are many occurrences in other parts of the country so the mineral is in plentiful supply. Few minerals have so many uses and important military applications. Recovery of lithium compounds from the various minerals is inefficient. Research is on the current Bureau of Mines program and industry is showing a very great interest in better methods of recovery.

Anticipated requirements by the year 1955 are estimated at more than 10 million pounds of lithium carbonate equivalent. For this tonnage about 50,000 tons of 5 percent spodumene equivalent will be required.

Western Hemisphere: Is entirely self-sufficient in the United States.

MAGNESIUM

1. United States

(*a*) *Production.*—Production of magnesium in 1952 was 106,000 tons and 93,000 tons in 1953.

(*b*) *Consumption.*—The average annual consumption of magnesium is 50,000 tons.

The United States is entirely self-sufficient within its continental borders.

2. Western Hemisphere

The United States and Canada are the only two countries in the Western Hemisphere to report production facilities.

3. Comments

Virtual self-sufficiency of magnesium is assured because of unlimited supplies of sea water, which contains an estimated thirteen one-hundredths of 1 percent of magnesium. Magnesium is produced from sea water by the electrolytic process. If shortage of electric power should impair full capacity production in the two electrolytic magnesium plants on Galveston Bay in Texas, the five silicothermic plants which are being held in standby condition could be reactivated to capacity production very rapidly. All raw materials for their use are available in the United States in abundant supply, readily accessible to each plant.

Productive plants' capacity in the United States is 123,000 tons, annually. Production in Canada was estimated at 5,000 tons in 1952. Annual productive capacity in Canada is estimated at 10,000 tons. The United States and Canada are the only countries in the Western Hemisphere to report magnesium-production facilities.

The abundance of all needed raw materials for production of magnesium, by both electrolytic and thermic reduction processes, results in placing this metal in position for an ever-widening program of substituting magnesium for other more scarce metals.

Additional research on thermic production processes might well lead to a production process competitive with electrolytic production, thus reducing requirements for electric energy.

Special problems yet to be solved are the development of properties and uses of magnesium through discovery of new alloys with improved physical properties, and the development of alloying, fabricating, and finishing techniques.

Western Hemisphere: Self-sufficient.

Substitutes: Aluminum is competitive and titanium may become so.

Uses: Light metal alloys, Kroll process in manufacture of titanium.

See page 311, hearings, part 1 for details.

MANGANESE

1. United States

(*a*) *Production.*—Domestic production of manganese under Government purchase programs for 1953 was 161,000 long tons of ore.

(*b*) *Consumption.*—Domestic consumption for 1952 was 1.9 million long tons. Estimated consumption for 1953 is 2.5 million tons. This figure varies with steel production.

The United States has large tonnages of materials which with technical progress could make the country self-sufficient in the future. One of the most important of these is the large quantity of manganese-bearing open-hearth slags accumulated, and steadily accumulating, at the dumps of the Nation's steel mills. It has been estimated that the quantity of this slag produced annually at steel plants in this country is adequate to supply nearly one-half the domestic needs for manganese. A Government-financed pilot plant is currently in operation on the slag problem.

The Cuyuna Range of Minnesota is estimated to have 10 million to 25 million tons of metallic manganese contained in 500 million tons of manganiferous slate and associated material. This is apart from the manganese contained in the manganiferous iron ores of the range. A Government-financed pilot plant is now working on these deposits. Aroostook County, Maine, is estimated to have 28 million tons of metallic manganese in manganiferous ferruginous slates averaging about 9 percent manganese. Of this quantity, 22,800,000 tons of the element is contained in 256 million tons of rock at one deposit. There are other large deposits in the West, one near Henderson, Nev., where a concentrating mill is currently operating, and the other at Artillery Peak, Ariz.

Research work on manganese should be pushed to a definite conclusion as soon as possible and not wait until the problem is again forced on our attention.

2. Western Hemisphere

The position of the Western Hemisphere is very favorable. In 1952 the Western Hemisphere produced 710,000 tons of ore. Total reserves in Brazil alone are estimated at 60 million tons of shipping-grade ore or 45 percent manganese. Bethlehem Steel is now developing one deposit which is estimated to contain 25 million tons of 50-percent ore. Shipments on a large scale are scheduled to begin in 1956.

When the Brazilian deposits are in full production, the United States could be free of dependence on India and Africa as well as having a less vulnerable sea route. Other South American and Caribbean countries have known manganese occurrences, and the possibilities for discoveries of important commercial reserves are believed to be very good, particularly in Venezuela.

Western Hemisphere: Self-sufficient.

Substitutes: None that are satisfactory.

Uses: Steelmaking. No steel can be made without manganese.

See page 80, hearings, part 1, for details.

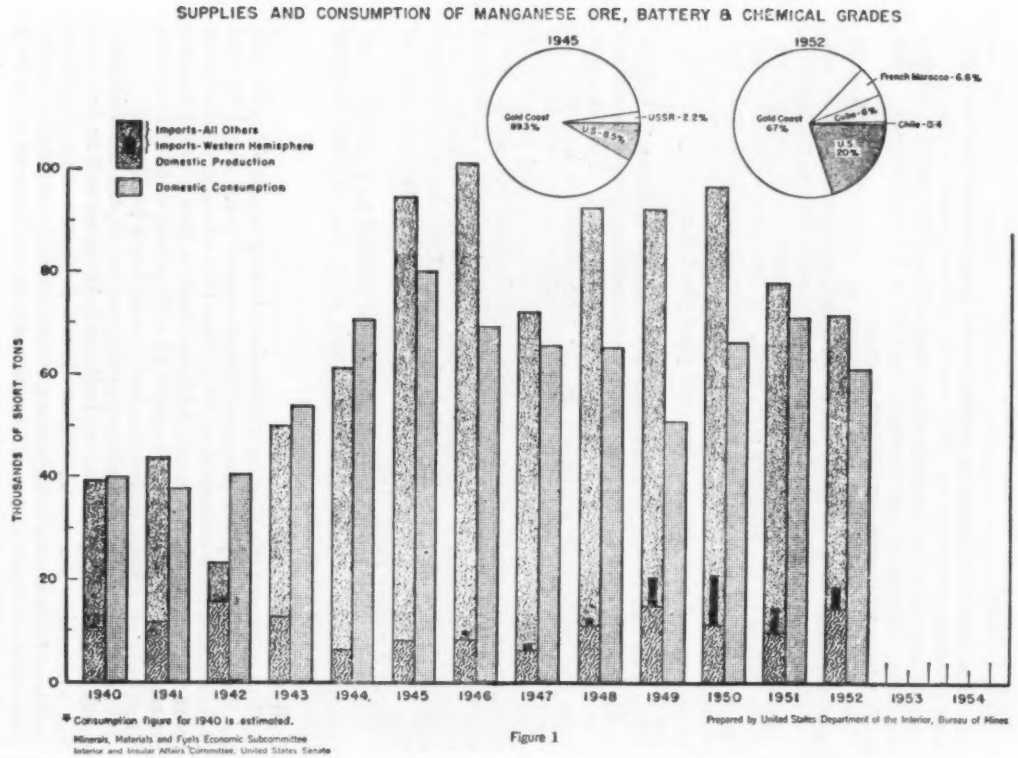
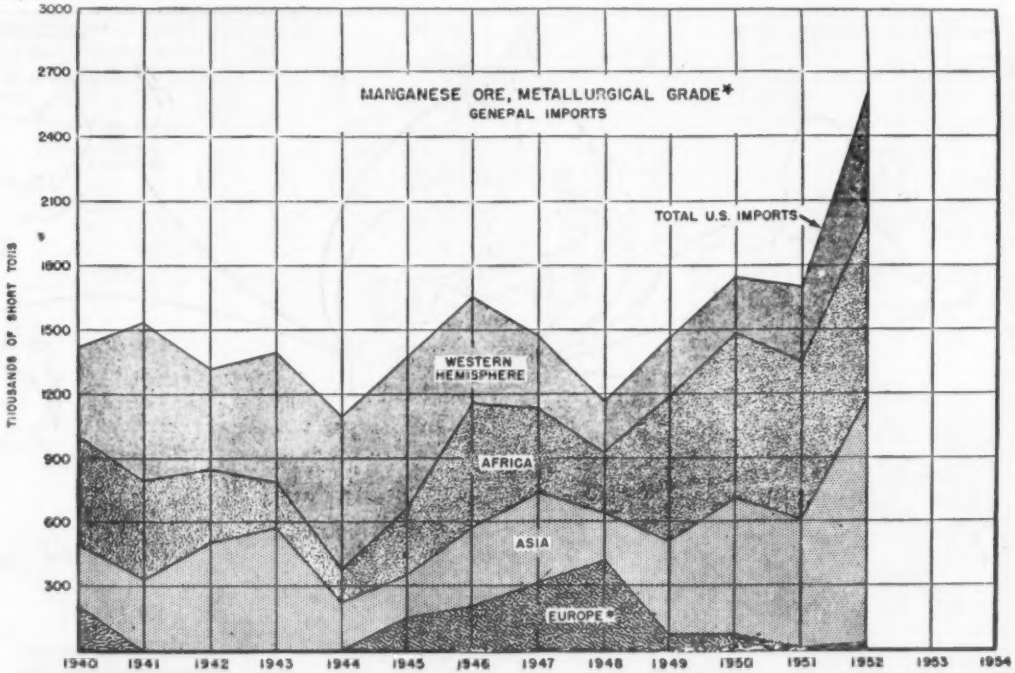

SUPPLIES AND CONSUMPTION OF MANGANESE ORE, BATTERY & CHEMICAL GRADES
1945
1952
Gold Coast 89.3%
USSR - 2.2%
U.S. - 8.5%
Gold Coast 67%
French Morocco - 6.6%
Cuba - 6%
Chile - 5.4
U.S. 20%
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
THOUSANDS OF SHORT TONS
100
80
60
40
20
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
* Consumption figure for 1940 is estimated.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

3000

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 1



* Includes some chemical grade
* Includes 23,000 tons from Australasia, 1952.

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

45187—54—8

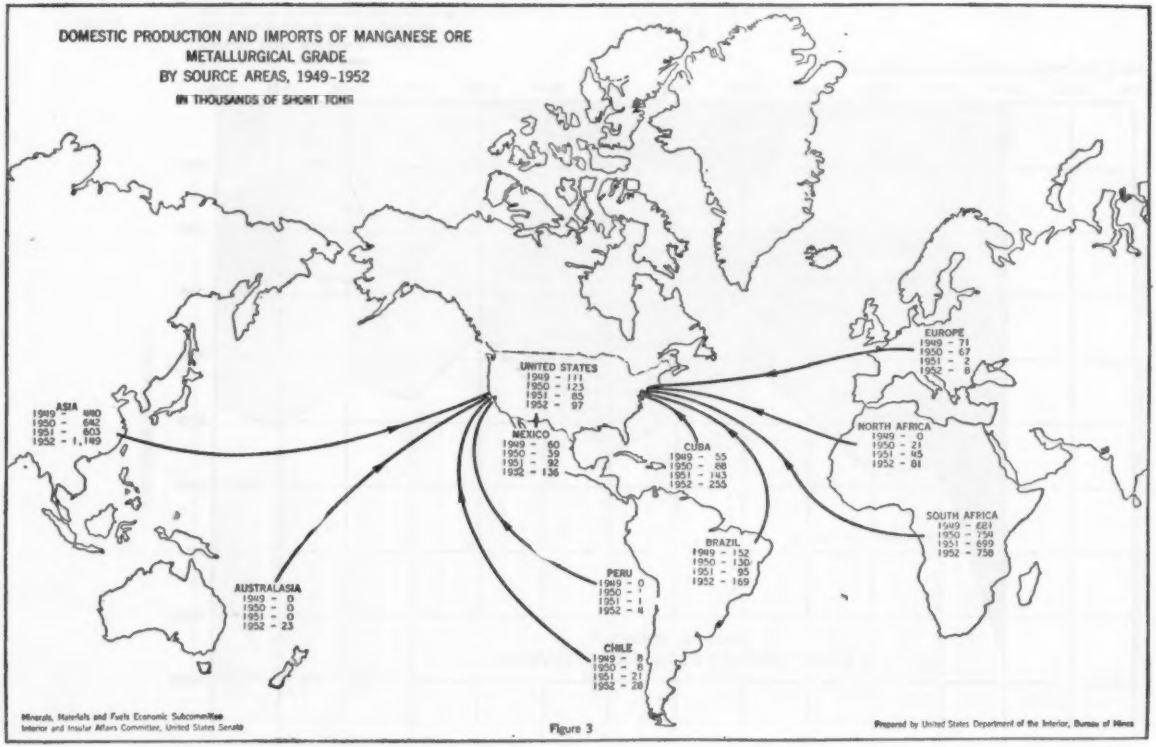
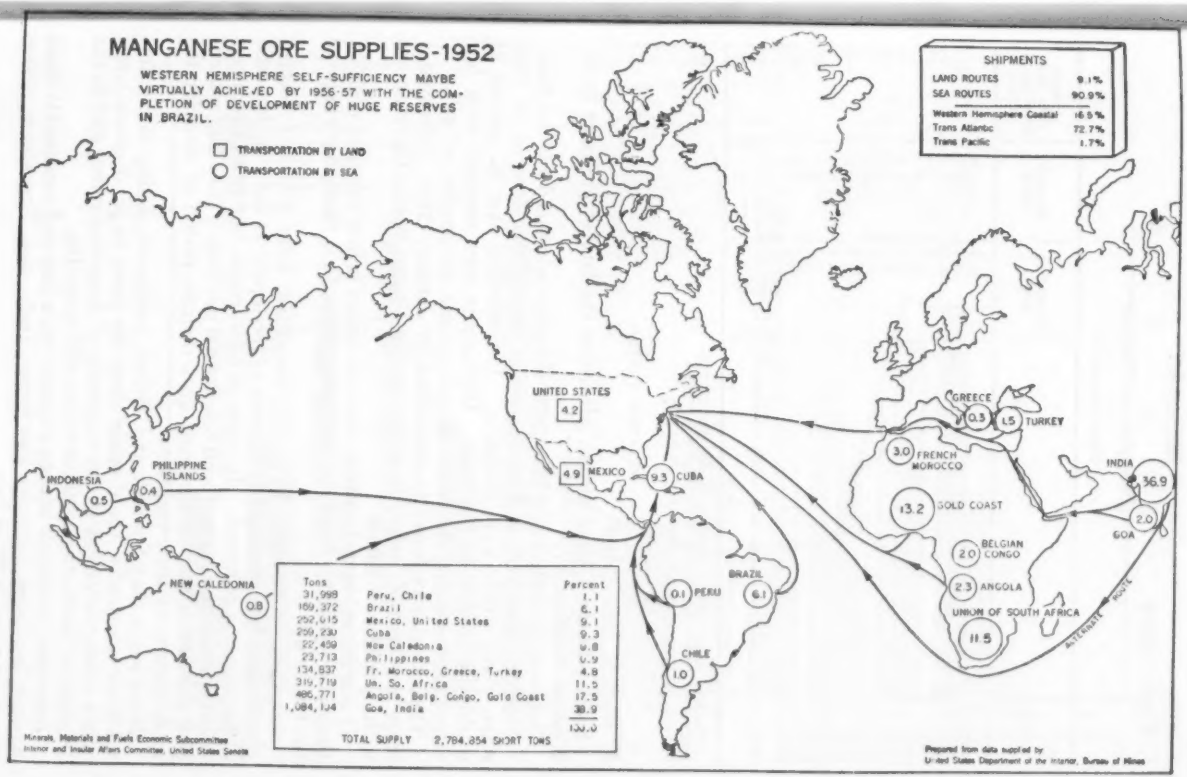

DOMESTIC PRODUCTION AND IMPORTS OF MANGANESE ORE
METALLURGICAL GRADE
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF SHORT TONS
ASIA
1949 - 440
1950 - 642
1951 - 603
1952 - 1,169
UNITED STATES
1949 - 111
1950 - 123
1951 - 85
1952 - 97
MEXICO
1949 - 60
1950 - 39
1951 - 92
1952 - 136
CUBA
1949 - 55
1950 - 88
1951 - 143
1952 - 255
BRAZIL
1949 - 152
1950 - 130
1951 - 95
1952 - 169
PERU
1949 - 0
1950 - 1
1951 - 1
1952 - 4
CHILE
1949 - 8
1950 - 8
1951 - 21
1952 - 28
AUSTRALASIA
1949 - 0
1950 - 0
1951 - 0
1952 - 23
EUROPE
1949 - 71
1950 - 67
1951 - 2
1952 - 8
NORTH AFRICA
1949 - 0
1950 - 21
1951 - 45
1952 - 81
SOUTH AFRICA
1949 - 681
1950 - 759
1951 - 699
1952 - 758
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 3

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 3

Prepared by United States Department of the Interior, Bureau of Mines



MERCURY

1. *United States*

Production and imports

[Flasks of 76 pounds]

	Production (100's)	Imports (100's)	Average New York price (round figures)
1940	37.8	1.71	
1941	44.9	77.0	$186
1942	50.9	31.5	198
1943	51.9	32.9	196
1944	37.7	10.5	120
1945	30.7	18.6	136
1946	25.3	13.9	98
1947	23.2	13.0	83
1948	14.4	31.5	80
1949	9.9	103.0	80
1950	4.5	56.0	74
1951	7.3	47.8	212
1952	12.5	71.8	196
1953	14.3	67.8	193
1954	(1)		235–238
	(2)		255–260
	(3)		275

[1] For May arrival. American Metal Market Apr. 28, 1954.
[2] Small lots only. American Metal Market May 27, 1954.
[3] Small lots only. American Metal Market June 19, 1954.

MERCURY CARTEL

2. *Western Hemisphere*

Second to the United States, Mexico is the largest producer in the Western Hemisphere.

Between May 1953 and May 1954 the price advanced $65 per flask.

Mercurio-Europeo, a Spanish-Italian cartel, was formed in 1928 when world stocks were excessive. It controlled over 80 percent of world production at the time. High-grade ores coupled with low wages have enabled the cartel to manipulate the market at will.

The cartel was formally disbanded in January 1950, following a large purchase of Italian mercury by the United States Government with counterpart funds.

It is quite evident, however, that the cartel is in a stronger position than ever; judging from the foregoing table, it is charging whatever the traffic will bear.

American consumers have not benefited from low-cost foreign production, but become the victims of monopoly as soon as domestic competition is removed. In spite of high wages American producers could operate at a price of well below $200 per flask if they had reasonable protection and could count on a definite period of time for the amortization of their plants.

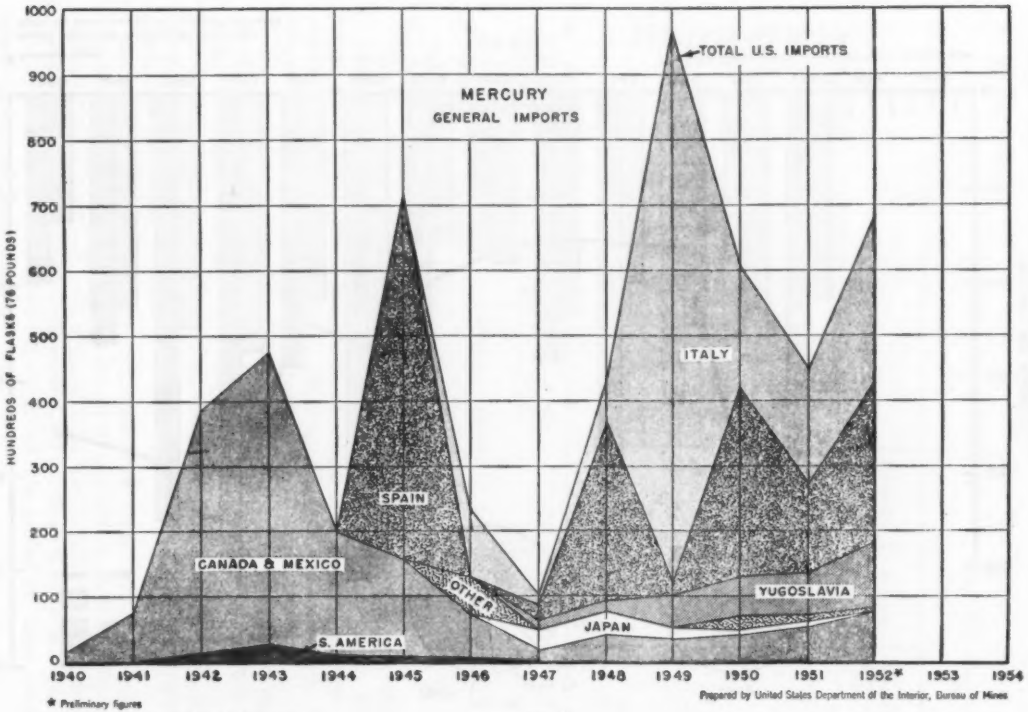
Knowledge that Spanish and Italian producers, acting either formally or informally, could easily drop the price to pre-Korean levels was a strong deterrent to the reopening of American mines and to the increase of production at those mines still operating.

American producers cannot compete on a fair and reasonable basis against low-wage countries like Spain, Italy, and Yugoslavia, where the daily wage is $1 or less.

American miners receive $16 per day plus fringe benefits that total another $2.

SUPPLIES AND CONSUMPTION OF MERCURY
AVERAGE PRICE PER FLASK (76 POUNDS)
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
HUNDREDS OF FLASKS
DOLLARS PER FLASK
1947
Japan 9%
Spain 7%
Italy 4.5%
Yugoslavia 4.5%
Mexico 5%
U.S.-70%
1952
Italy-35%
Mexico 10%
Spain-30%
U.S.-15%
Yugoslavia 13%
1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952* 1953 1954*
* Preliminary figures
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1



Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

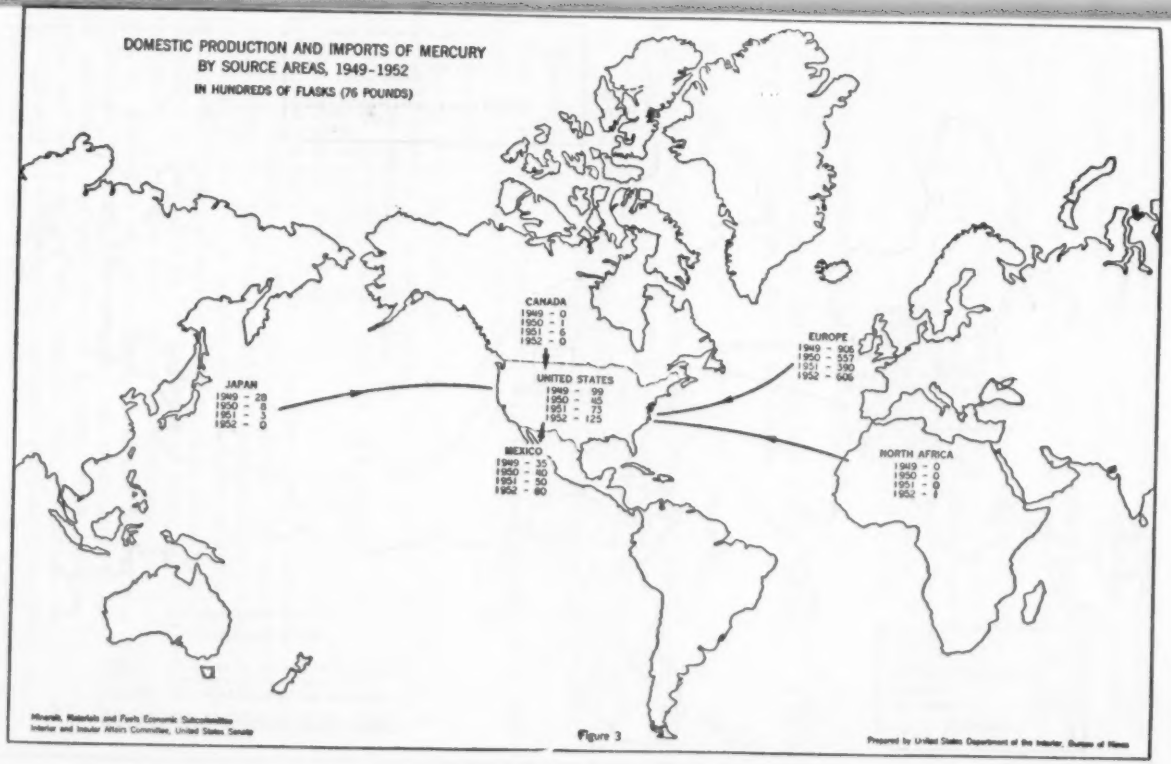


Figure 3

MERCURY SUPPLIES-1952
VIRTUAL SELF-SUFFICIENCY WAS ATTAINED DURING WORLD WAR II WITH INCENTIVE PRICES. FLASK AT 76 POUNDS OF MERCURY
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 25.3%
SEA ROUTES 74.7%
Western Hemisphere Coastal 0
Trans Atlantic 74.7%
Trans Pacific 0
CANADA 0.1
UNITED STATES 15.4
MEXICO 9.9
SPAIN 29.9
ITALY 32.0
YUGOSLAVIA 12.6
OTHER EUROPEAN 0.1
FRENCH MOROCCO 0.1
Hundreds of Flasks
295 Canada, Mexico, United States 25.3
1 French Morocco 0.1
1 Other European 0.1
839 Italy, Spain, Yugoslavia 74.5
1,136 100.0
TOTAL SUPPLY 81,200 FLASKS
Based on data supplied by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

It is also well to remember that in time of war these foreign sources of supply would be vulnerable to enemy action or claim neutrality. In either case we would not get the mercury.

The Almaden mine in Spain was equipped with a large and modern plant in 1953. This means lower cost production, but American consumers will not benefit.

United States deposits of mercury are scattered widely in the Western States, but most of them are located in California, Nevada, Oregon, Idaho, Texas, and Arizona. The average mercury content of ores treated in 1952 was 0.35 percent whereas those treated in Spain and Italy, which supplied 63 percent of the world production in 1952, ranged from over 1 percent up to and possibly exceeding 6 percent.

Western Hemisphere: Can be self-sufficient.

Substitutes: None.

Uses: Electrical control instruments, insecticides, boilers.

See page 172, hearings, part 1, for details.

MICA (STRATEGIC)

1. United States

United States self-sufficiency in strategic mica, which consists of sheet mica other than punch and circle mica, is less than 1 percent.

Estimated 1952 United States consumption of sheet mica (block, film, and splittings) was 14,097,000 pounds.

United States production of sheet mica in 1952 was 73,000 pounds.

2. Western Hemisphere

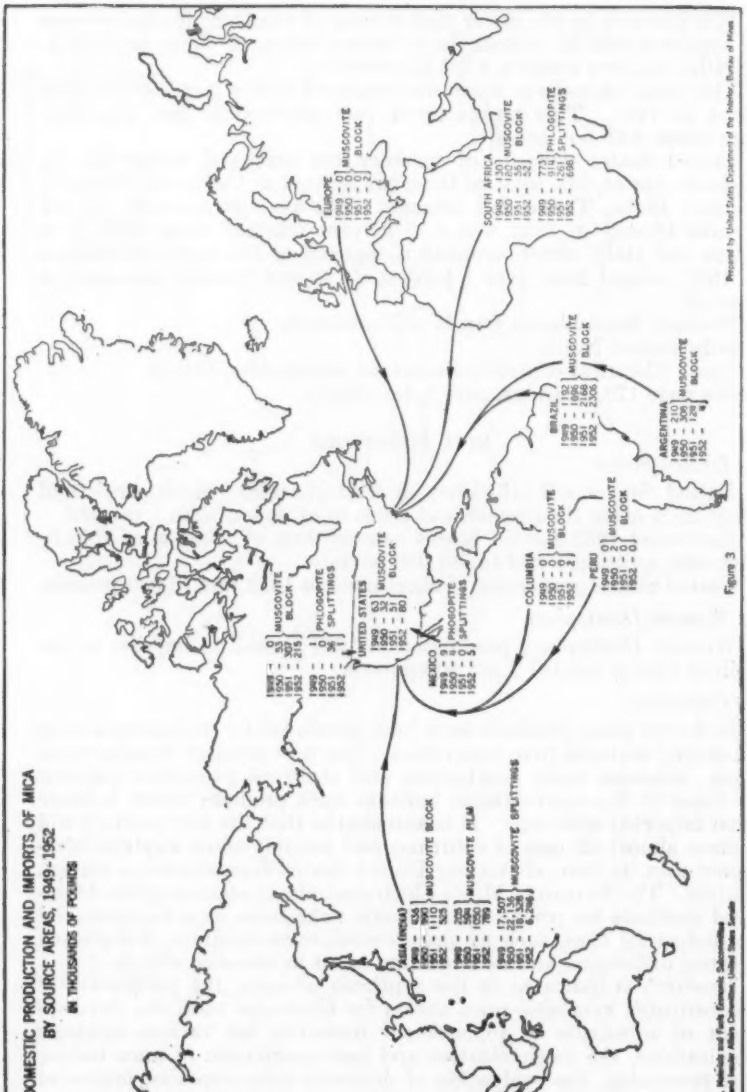
Western Hemisphere production in 1952 (based on imports to the United States) totaled 2,533,000 pounds.

3. Comments

In recent years, methods have been developed for producing a mica insulating material from scrap mica. The new product, reconstituted mica, possesses many mechanical and electrical properties superior to those of the conventional built-up mica product, which is made from imported splittings. It is anticipated that the new product will replace almost all uses of splittings and possibly some strategic electronic uses, in turn alleviating United States dependence on foreign sources. The Bureau of Mines Electrotechnical Laboratory has developed methods for producing synthetic flake mica as a raw material for industrial uses, such as glass-bonded mica ceramics, hot-pressed ceramic dielectrics, and as a bonding agent in abrasive wheels.

Research is indicated in the synthesis of mica, the production of reconstituted synthetic mica sheets for electronic uses, the development of substitute or replacement materials for various strategic applications, the mechanization and instrumentation of mica testing and processing, the evaluation of domestic mica deposits, improved mining and recovery processes, and the recovery and economic utilization of coproduct and byproduct minerals often associated with mica.

The chief problem of the strategic mica industry is to assure adequate supplies in periods of emergency. Adequate reserves are known in Brazil, but more business and technical assistance, improved


DOMESTIC PRODUCTION AND IMPORTS OF MICA
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF POUNDS
Prepared by United States Department of the Interior, Bureau of Mines
Figure 3

equipment, and better transportation are needed to establish Western Hemisphere self-sufficiency.

Western Hemisphere: Self-sufficiency can be attained through expansion of reconstituted and synthetic expansion.

Substitutes: Synthetics are being developed. Uses: Insulation for electrical equipment.

See page 270, hearings, part 1, for details.

MOLYBDENUM

1. United States

Production.—Production is 58 million pounds per year. The all-time high production was 61.7 million pounds in 1943 and maximum consumption was 56.4 million pounds in 1942.

The United States is the world's leading producer of molybdenum concentrates.

Consumption.—Consumption of concentrates is now at an annual rate of 31 million pounds.

2. Western Hemisphere

Western Hemisphere production is now about 61 million pounds per year; however, 10 million pounds was shipped to points in the Eastern Hemisphere in 1953.

3. Comments

Maintaining the present high productive capacity during extended periods of low demand is a special problem, as the production was stimulated by contracts that will expire in a few years. Pure molybdenum and molybdenum alloys have many high-temperature applications; several technical problems remain in this field.

Western Hemisphere: Self-sufficient.

Substitutes: None needed. It is a substitute for other metals.

Uses: Alloys for high strength and high temperature steels.

See page 89, hearings, part 1, for details.

NICKEL

1. United States

Production.—Production of nickel in the United States is estimated at about 700 short tons in 1953 and may increase to 2,500 tons in 1954.

Consumption.—Consumption of nickel in the United States was about 106,000 short tons in 1953.

The United States currently is producing less than 1 percent of its nickel requirements but will probably be producing nearly 10 percent by 1955.

2. Western Hemisphere

Production of nickel in the Western Hemisphere was about 157,000 short tons in 1953 and currently is at a rate of about 170,000 tons.

Canada not only dominates nickel production at present but is likely to maintain that position for many years because of the richness in both nickel and copper and enormous reserves. Canada supplied about 86 percent of the free world production of nickel in 1952.

CUBA POSITION

The Cuban Nickel Co., a United States Government corporation, owns a nickel-producing plant and townsite at Nicaro, Cuba. The plant was completed and began operating in late 1943. Operation ceased March 31, 1947. Meanwhile, 3,323,075 dry short tons of ore containing 91,702,615 pounds of nickel was processed, from which 82,735,148 pounds of oxide containing 63,571,414 pounds of nickel plus cobalt was recovered. The plant has an annual capacity of about 15,000 short tons of nickel.

Rehabilitation of the plant was begun early in 1951, and 4 of the 12 furnaces were put into operation January 31, 1952. The last two furnaces were put into operation July 7. During the year 11,604 tons of oxide containing 8,958 tons of nickel plus cobalt was produced.

The nickeliferous iron ores of eastern Cuba are the world's largest potential sources of nickel. These deposits are estimated to total at least 3 billion tons of ore containing about 24 million tons of nickel. However, the average low content of nickel in the deposits, combined with the finely divided distribution of the nickel in an iron-rich material has made it relatively costly to obtain a product of high nickel content. Nevertheless the nearness of Cuba to the Atlantic seaboard and the Gulf ports of the United States gives it importance as a source of nickel.

Expansion of existing production facilities now underway and facilities being installed to serve newly developed deposits will result in capacity in North America to produce nearly 200,000 short tones of nickel in 1956.

3. Comments

A large strategic stockpile of nickel would make possible the meeting of mobilization demand without inordinate expansion of peacetime production capacity. Unfortunately, the Stockpile accumulation at present is far short of its objective, consequently, large expansion of production and capacity is necessary.

SUBSTITUTES AND REPLACEMENTS

Nickel can be saved in relatively large amounts by the increased use of triple alloy steels (nickel-chromium-molybdenum), boron-containing steels, or other substitute steels; and by the downgrading of high-nickel alloy compositions, where lower grade nonferrous alloys and stainless steels may be substituted. Some of the nickel-containing stainless and heat-resisting steel production could similarly be downgraded. Nickel can be saved in nonvital uses of magnetic materials, and by thinner coatings on plated items. Chromium-manganese alloys, some containing no nickel and some with only minor additions of the element, are suitable alternates for specific applications of 18-8 stainless steels. For certain applications chromium stainless steel can be used in lieu of nickel-chromium stainless steel.

Western Hemisphere: Self-sufficient.

Substitutes: Chromium, manganese, molybdenum.

Uses: Alloy in high strength, high temperature and stainless steels.

See page 98, hearing, part 1, for details.

SUPPLIES AND CONSUMPTION OF NICKEL
YEAR END PRICES FOR ELECTROLYTIC NICKEL
Imports-All Others
Imports-Western Hemisphere
Domestic Consumption
Price
1949
U.S. - 0.9%
Europe - 4.1%
Canada - 95%
1958
U.S. 0.6%
Cuba 6.7%
Europe - 25%
Canada - 67.2%
THOUSANDS OF POUNDS - NICKEL CONTENT
CENTS PER POUND - ELECTROLYTIC NICKEL
NA
1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954
Prepared by United States Department of the Interior, Bureau of Mines
NA Domestic Consumption data not available 1940 thru 1944
Domestic Production segregable, included in total.
Minerals, Materials and Fuels Economic Subcommittee
Senate and House Affairs Committee, United States Senate

Figure 1

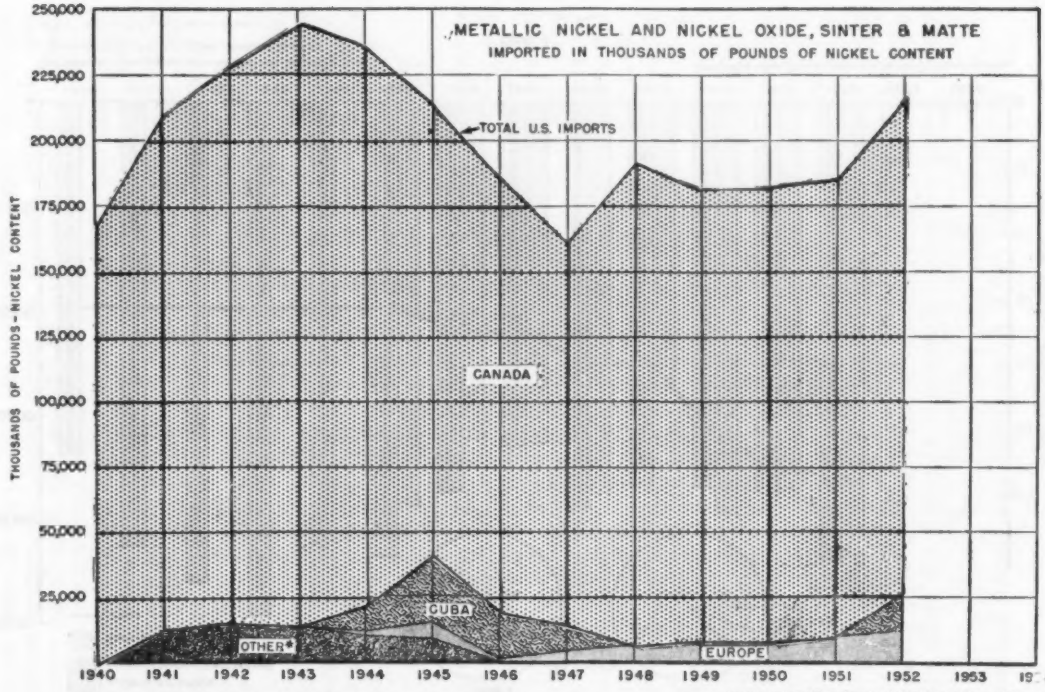

METALLIC NICKEL AND NICKEL OXIDE, SINTER & MATTE
IMPORTED IN THOUSANDS OF POUNDS OF NICKEL CONTENT
THOUSANDS OF POUNDS - NICKEL CONTENT
250,000
225,000
200,000
175,000
150,000
125,000
100,000
75,000
50,000
25,000
TOTAL U.S. IMPORTS
CANADA
CUBA
OTHER*
EUROPE
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
* Includes 2,287,000 lbs. in 1943 and 665,000 lbs. in 1944 captured war material imported from French Morocco but originating in Canada.
Prepared by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

imported from French Morocco but originating in Canada.

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

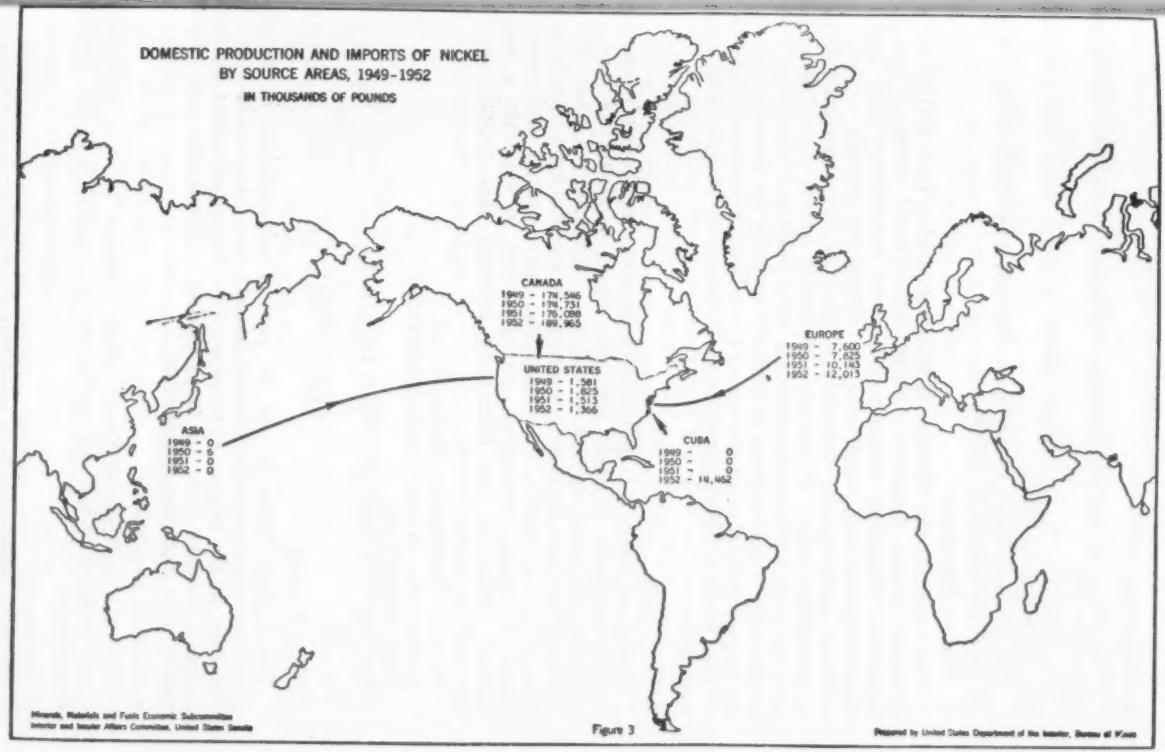


Figure 3

RADIO-GRADE QUARTZ

1. United States

There was no known domestic production of natural radio-grade quartz in 1952.

Consumption of radio-grade quartz in the United States totaled 502,000 pounds in 1952.

The United States depends on imports, principally from Brazil, for its requirements of quartz.

2. Western Hemisphere

Production in the Western Hemisphere during 1952 totaled about 1,134,000 pounds (based on imports by the United States and calculations from Brazilian Government export statistics). The United States imports from Brazil were about 1,049,300 pounds.

Good-quality quartz crystals are being produced synthetically on a pilot-plant basis. If enough radio-grade quartz crystal is stockpiled to meet wartime requirements for 2 years and high priority on critical alloy steels is given to industry to build the necessary plants, an ample supply of synthetic quartz crystal can be produced thereafter.

The Western Hemisphere, is self-sufficient in natural radio-grade quartz.

3. Comments

Continued research is indicated on improved methods of producing synthetic quartz crystals and on other synthetic piezoelectric materials to meet special conditions. Important United States industry problems are to assure continuing supplies from Brazil during peacetime, to decide on stockpiling requirements and standby synthetic crystal production capacity, and to maintain a going-concern processing and fabricating industry that quickly can be expanded in an emergency.

Western Hemisphere: Self-sufficient.

Substitutes: Is being made synthetically.

Uses: Radio work.

See page 276, hearings, part 1, for details.

RARE EARTHS

1. United States

The United States is now 60 percent self-sufficient in its production of the rare-earth minerals, namely, monazite and bastnaesite. However, in the advent of an emergency the requirements for these minerals may be 2 to 10 times greater. (Production and import statistics on monazite are classified.)

2. Western Hemisphere

With the inclusion of Brazil, ample reserves for any predictable future demand of the rare earths can be developed in the Western Hemisphere.

3. Comments

Thorium, which may be a substitute for uranium, is at present only recovered from the processing of monazite. For many of the strategic uses of the rare-earth materials there are no substitutes. In some of the less essential industrial applications, substitution for rare-earth materials can be made. Selenium and white arsenic can replace rare

earths in decolorizing glass; rouge can replace cerium salts in polishing lenses; iron and calcium fluoride can, in part, replace the rare earths used in carbon-arc-electrode cores; and zirconium-impregnated lead could replace the ferrocerium used in the flints of mechanical lighters. Other than selenium, which is in very short supply, the listed substitutes are not equally effective replacements. Nevertheless, these substitutes could alleviate an emergency shortage of rare earths until mining and processing equipment could be built to exploit the ample domestic and Brazilian reserves.

The search for domestic deposits of monazite and other rare-earth minerals should be continued so as to make this country independent of all foreign sources of supply. In conjunction with this search, beneficiation and extraction methods to recover the rare-earth minerals should be made in order to insure the proper utilization of our natural resources. Research on methods to separate the individual rare-earth elements and a study of their properties should be undertaken immediately to determine the new uses for which these little-known elements are best adapted.

The immediate problem of the rare-earth industry is the uncertainty regarding the future market of the rare earths and byproduct minerals. Rare-earth processors are reluctant to renew contracts with domestic producers because of the frequent and unpredictable importations of monazite from foreign sources. If present monazite producers in Idaho cannot sell to the Government stockpile and if they cannot make long-term contracts with the processors nor obtain a market for accessory minerals such as ilmenite, zircon, and garnet, they will be forced to discontinue operations. In this case, the United States will again depend wholly upon foreign sources of supply for thorium and monazite.

See page 216, hearings, part 1, for details.

RUTILE

The principal commercial ores of titanium are ilmenite ($FeO.\ TiO_2$); arizonite ($Fe_2O_3.\ 3TiO_2$), referred to by industry as ilmenite; and rutile (TiO_2). Ilmenite ores, used mainly in the production of titanium dioxide pigments, are found extensively throughout the United States. Rutile ores, on the other hand, are present in only a few domestic areas.

The major use for rutile to date has been for welding-rod coatings. Of the total consumption of 18,317 short tons in 1952, 62 percent went into welding-rod coatings, 16 percent was used for alloys and carbide, 2 percent for ceramics, and 20 percent for miscellaneous uses such as fiberglass and titanium metal. Although rutile is used in the production of titanium metal, it is not available in sufficient quantities to support an expanding titanium-metal industry. Any major expansion of titanium-metal production must be premised on the use of ilmenite or high-titania slag.

Ilmenite, manufactured titanium dioxide, and Tanarc are substituted for rutile in the production of some welding-rod coatings. Tanarc (containing 70 percent TiO_2) is made from titanium slag imported from Canada. Manufacturers claim that the use of these substitutes is limited and that desired characteristics for most welding rods are obtained only with rutile.

Domestic production of rutile now comes from beach-sand operations at Melbourne and Jacksonville, Fla. Rutile was produced from the Magnet Cove rock deposit in Hot Spring County, Ark., until 1944 and from another rock deposit near Roseland, Va., until 1949.

About two-thirds of the present supply comes from Australia, the major rutile-producing country and the only country shipping rutile to the United States from 1948 to 1952. Rutile imports from Australia were 19,550 tons in 1952, establishing a new record over that previously set in 1943. Proved reserves of high-grade Australian rutile deposits total over 800,000 short tons.

World production of rutile in 1952 is estimated at 52,000 short tons—84 percent was supplied by Australia and 15 percent by the United States. The remaining 1 percent was produced by Brazil, French Cameroons, India, Norway, and Senegal.

Rutile was in short supply at the end of 1951 and the first part of 1952. In addition to removal of the price ceiling, other actions were taken to remedy this situation. The National Production Authority announced inventory controls on rutile under NPA Regulation 1, as amended, January 28, 1952, and the Defense Minerals Exploration Administration, under DMEA Order 1, issued March 7, 1952, placed rutile and brookite in the classification of strategic and critical materials and set forth provisions under which the Government would contribute up to 75 percent of the total exploration costs for these materials. By the end of 1952 supply and requirements about balanced. Rutile was removed from the inventory control list September 9, 1952, and DMEA removed rutile and brookite from its strategic and critical list on May 16, 1953.

Rutile is the only titanium mineral or product included in the National Stockpile Current List of Strategic and Critical Materials. Rutile falls under List II, which includes materials acquired only through transfer of Government-owned surpluses.

The Tariff Act of 1930 placed titanium ores on the free list.

Western Hemisphere: Small quantities of rutile at this time, but is self-sufficient in elmenite.

Substitutes: Manufactured titanium dioxide.

Uses: Welding-rod coatings, currently for small production of titanium metal.

See page 321, hearings, part 1, for details.

SELENIUM

1. United States

The United States production of 750,000 pounds of selenium annually represents avout 50 percent of domestic needs.

2. Western Hemisphere

Selenium production in Canada is estimated to be 350,000 pounds yearly. Mexico is the only other producer of selenium in the Western Hemisphere, and its production consists of only a few thousand pounds annually.

3. Comments

There are no satisfactory substitutes for selenium in any of its applications. Limited substitutions for selenium can be made by: (1) Using rare-earth salts in large quantities to decolorize glass;

(2) replacing selenium with sulfur and tellurium in some chemical applications; and (3) using titanium oxide, germanium, and silicon to a limited extent in some electronic applications.

To become self-sufficient in selenium, it will be necessary to initiate exploration programs to delineate the large low-grade deposits of selenium-bearing shales in Wyoming and Idaho. Laboratory and pilot-plant-scale studies on selenium-extraction techniques should be made at Bureau of Mines stations. Present recovery of selenium is from electrolytic-copper-refinery sludges, and maximum economical extraction from this source has been attained. Self-sufficiency for vital and strategic selenium can only be accomplished by development and utilization of seleniverous deposits in our Western States that previously were considered uneconomical.

Western Hemisphere: Can be self-sufficient.

Substitutes: Manganese, gold, copper, telurium, germanium, silicon, titanium dioxide.

Uses: Glass, pigment, rubber, stainless steel, radio and television industries.

See page 220, hearings, part 1, for details.

STEATITE TALC

FOR GRINDING

The United States is self-sufficient in supplies of steatite talc for grinding, as the result of recent discovery and development.

The estimated annual average consumption of steatite talc for grinding in the United States is 20,000 short tons.

No data are available to determine what proportion of Western Hemisphere production, other than that of the United States, can be classed as steatite talc for grinding.

Substitutes and replacements include alumina, forsterite, zircon, and cordierite ceramic mixtures.

Since the United States is self-sufficient and reserves are ample for many years, research to develop new uses should be encouraged, especially those where talc might be substituted for less plentiful materials.

See page 255, hearings, part 1, for details.

BLOCK

There are no known reserves of block steatite talc in the United States or in the Western Hemisphere.

The estimated annual average consumption of block steatite talc in the United States is 250 to 350 short tons.

The Western Hemisphere annual production of block steatite talc is zero. There are no proven substitutes or replacement materials for block steatite talc as a machinable ceramic dielectric. Certain former uses were replaced by steatite talc and other ceramic mixtures, and new forming techniques might further reduce the quantity of block steatite talc required in the future. Four potential substitute materials that have not been thoroughly evaluated, but which show promise are: phosphate-bonded talc, phosphate-bonded synthetic mica, hot-pressed synthetic mica, and magnesium oxychloride-bonded talc.

The United States can become independent within its continental boundaries of foreign supplies of block steatite talc if insulators made from the proposed replacement materials perform satisfactorily under service conditions in degassing and life-expectancy tests.

The lack of objective scientific tests to prove the essentiality of of block steatite talc has hampered efforts to evaluate the replacement materials.

See page 255, hearings, part 1, for details.

TIN

1. United States

Production.—The United States production (99 tons in 1952 and 95 tons in 1953) originated almost entirely from placer deposits in the Seward Peninsula of Alaska.

Consumption.—Estimated tin consumption, both primary and secondary, was 83,500 long tons in 1953, an increase of about 8 percent compared with 1952. In the 3 years 1950–52 the United States intake of tin for commercial use or for transfer to the national stockpile averaged 91,000 tons a year or over half the world production. The commercial consumption of primary tin was 47,200 tons in 1949, 71,200 tons in 1950, 56,900 tons in 1951, and 45,300 tons in 1952.

The United States is wholly dependent upon foreign countries for tin as only negligible quantities are available from domestic sources.

2. Western Hemisphere

In Canada production remains limited to the small and declining volume of tin available as an impurity in the lead-zinc mining operations of the Consolidated Mining & Smelting Co. Mexican production has fallen slightly through 1950–52 to a level of about 300 tons in the last year. Argentine production has remained fairly constant at around 250 tons a year since 1948. Bolivian production of tin in concentrates during 1953 totaled about 30,000 long tons, a 15-percent decrease from 1952.

3. Comments

In the second full year of normal trade since Pearl Harbor domestic consumption of tin increased by only 8 percent. Even so, it was small by past standards due largely to substitutions since World War II. Although in recent years there has been a large increase in the use of tinplate, the amount of tin used in its manufacture is little changed from the period immediately preceding World War II. Also, there has been a considerable loss of tin to lead and aluminum in foil and collapsible tubes. Likewise, there have been significant decreases of tin used in babbitts and solders.

The Western Hemisphere as a whole consumes far more tin than it produces. The situation in Bolivia poses critical and difficult problems, both political and technological. Solution of these problems will increase Western Hemisphere production, but complete self-sufficiency cannot be expected. Continued effort to develop new tin-producing areas in Alaska and Mexico should meet with reward.

The Longhorn Tin Smelter at Texas City, Tex., is the only tin smelter in the Western Hemisphere. It is the largest as well as the most efficient tin smelter in the world. It went into operation in 1942 and up to May 1954 had produced about 400,000 tons of tin. It has

SUPPLIES AND CONSUMPTION OF TIN
AVERAGE ANNUAL PRICE OF STRAITS TIN
1946
Bolivia 53.7%
Asia 24.1%
Europe 7.4%
Africa-14.8%
1952
Europe 33.5%
Asia 51.3%
Africa-1.6%
Imports-All Others
Imports-Western Hemisphere
Domestic Production Negligible
Domestic Consumption
Price
170
THOUSANDS OF LONG TONS
DOLLARS PER POUND
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 1

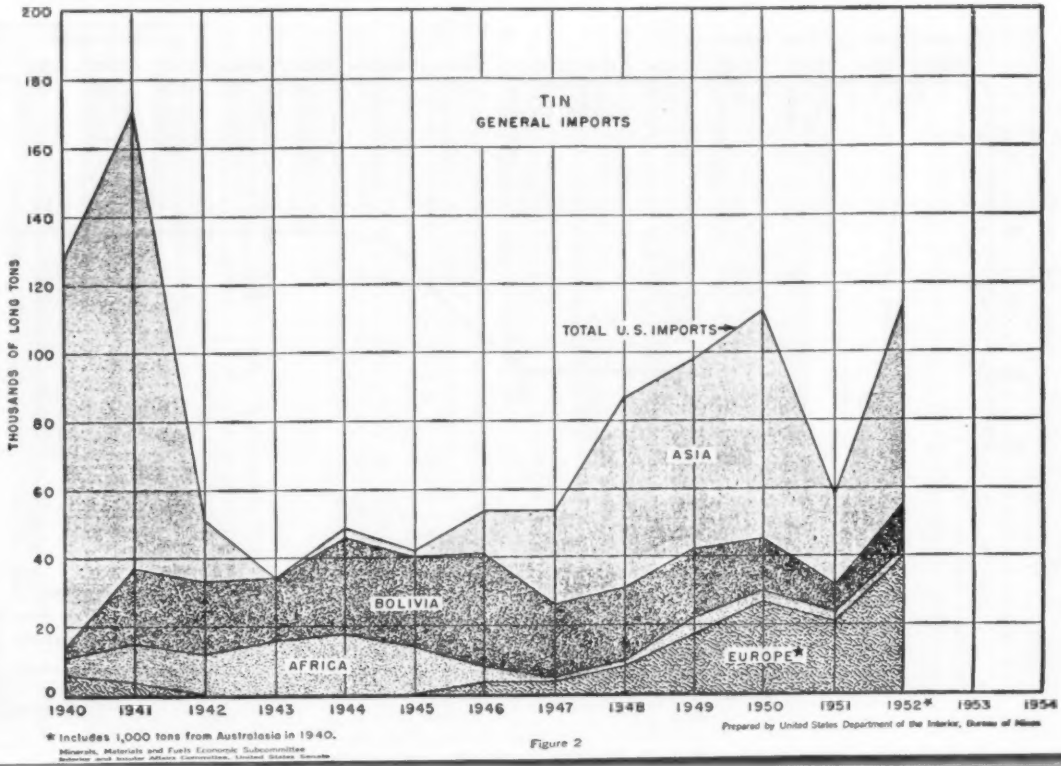

TIN
GENERAL IMPORTS
THOUSANDS OF LONG TONS
200
180
160
140
120
100
80
60
40
20
0
TOTAL U.S. IMPORTS
ASIA
BOLIVIA
AFRICA
EUROPE*
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
* Includes 1,000 tons from Australasia in 1940.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

Figure 2

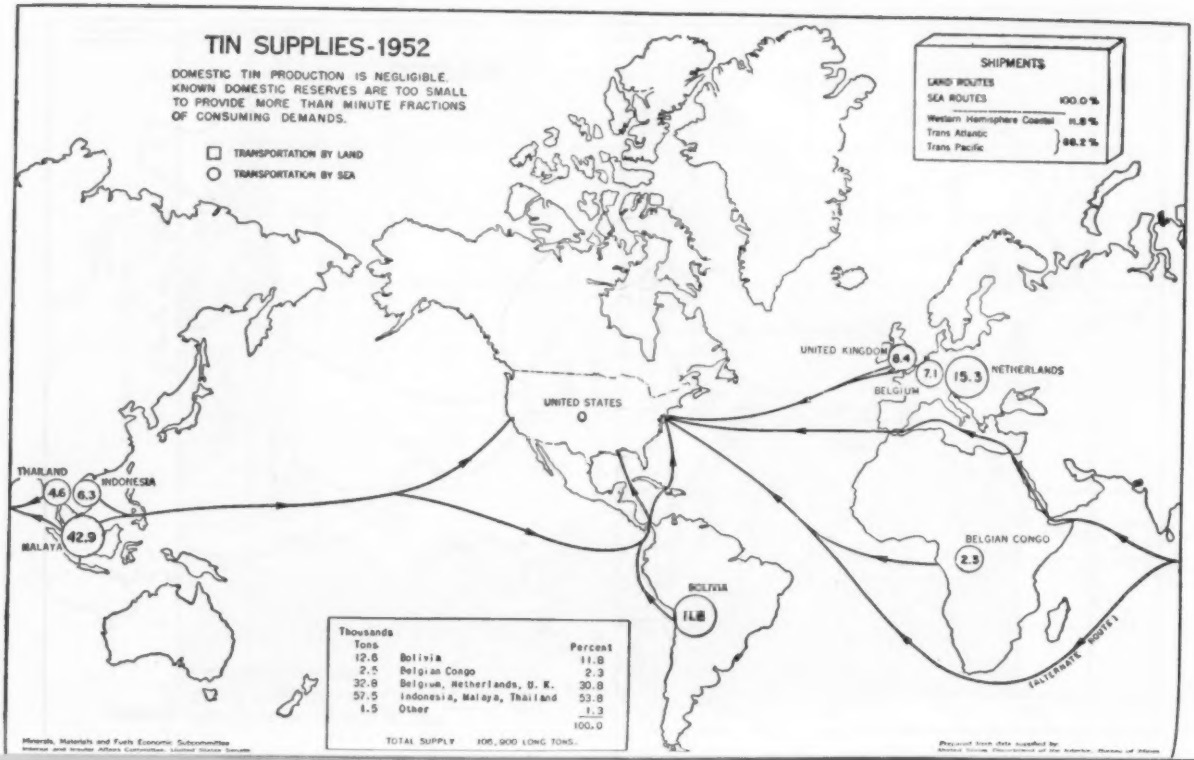
Figure 3

* Includes 1,000 tons from Australasia in 1940.

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

Prepared by United States Department of the Interior, Bureau of Mines


TIN SUPPLIES-1952
DOMESTIC TIN PRODUCTION IS NEGLIGIBLE. KNOWN DOMESTIC RESERVES ARE TOO SMALL TO PROVIDE MORE THAN MINUTE FRACTIONS OF CONSUMING DEMANDS.
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES
SEA ROUTES 100.0%
Western Hemisphere Coastal 11.8%
Trans Atlantic
Trans Pacific 88.2%
UNITED KINGDOM 8.4
7.1
15.3 NETHERLANDS
BELGIUM
UNITED STATES
THAILAND 4.6
INDONESIA 6.3
MALAYA 42.9
BELGIAN CONGO 2.3
BOLIVIA 11.8
ALTERNATE ROUTE
Thousands Tons
12.8 Bolivia 11.8
2.5 Belgian Congo 2.3
32.8 Belgium, Netherlands, U. K. 30.8
57.5 Indonesia, Malaya, Thailand 53.8
1.5 Other 1.3
100.0
TOTAL SUPPLY 106,900 LONG TONS.
Minerals, Materials and Fuels Economic Subcommittee
Prepared from data supplied by

operated largely on low- and middle-grade Bolivian concentrates. It can operate more efficiently on high-grade concentrates, and at times they have been available in small quantity.

The smelter was built as a security measure in 1942 and has served its purpose well. More than 12 years later, events in Southeast Asia are heading toward a dangerous situation. Under a resolution of Congress the smelter will be kept in operation until June 30, 1955. The tin produced will go into the stockpile.

Western Hemisphere: Bolivia is the only source can be self-sufficient for national defense.

Substitutes: Aluminum for foil and tubes, lacquers for containers. Best conservation measure has been electrolytic deposition instead of dipping of tinplate.

Uses: Tinplate, solder, and bronze.

See page 181, hearings, part 1, for details.

TITANIUM

1. United States

Consumption.—Present consumption of ilmenite concentrates (including titanium slag) in the United States is at a rate of about 760,000 short tons per year. Titanium pigments take about 99 percent of the ilmenite consumed in the United States. Domestic consumption of rutile is presently at a rate of about 17,000 short tons per year. Rutile is used mainly for welding rod coatings, alloys, and titanium metal.

Production.—Ilmenite concentrates are now produced in the United States at a rate of about 480,000 short tons per year, and rutile is produced domestically at a rate of under 10,000 tons per year.

2. Western Hemisphere

Canada, in addition to the United States, is the only other significant producer of titanium concentrates in the Western Hemisphere. It is estimated that 150,000 short tons of high titania slag was produced in Canada in 1953 from titaniferous hematite. Ultimate annual production of 250,000 tons of titanium slag from 550,000 tons of titaniferous hematite is planned.

3. Comments

Titanium is a low-density, silver-white metal between silver and stainless steel in color. The density of titanium is 0.16 pound per cubic inch, 60 percent heavier than aluminum but only 56 percent as heavy as alloy steel. Titanium alloys are much stronger than aluminum alloys, having tensile strength and hardness approaching that of many alloy steels. The strength-to-weight ratio at ordinary temperatures exceeds that of either aluminum or stainless steel. Titanium alloys also have unusual resistance to fatigue and great impact strength. Titanium metal is more resistant to corrosion than aluminum and as resistant as stainless steels; it is particularly resistant to sea-water corrosion and marine atmospheric weathering.

Tonnage production and improved processing techniques are making more and more titanium available for new applications in the following civilian and military services:

1. Airframe skins and structures where strength at intermediate temperatures or corrosion problems are found.

2. Aircraft powerplant applications where temperatures up to 1,000° F. are involved.

3. Naval or marine applications in which the complete resistance to sea-water corrosion exhibited by titanium is unique.

4. Ordnance and other equipment in which a combination of properties including light weight, corrosion resistance, and high strength, at intermediate temperature properties are required.

5. Industrial equipment for which titanium's particular corrosion resistance is desirable.

Although titanium is a new metal to industry, the large-scale production of its oxide has provided an excellent raw-material base for development of the metal.

Present commercial production of ductile titanium metal is based on modifications of the Bureau of Mines Kroll process. Titanium tetrachloride, produced by chlorination of titanium ores, is reduced to the metallic state with magnesium in an inert atmosphere of helium or argon. Magnesium chloride formed during the reaction; and excess magnesium are removed from the spongelike titanium by drainage and vacuum distillation. The titanium sponge is consolidated by melting in induction or electric-arc furnaces.

The principal raw materials required for production of ductile titanium metal by the Bureau of Mines process are titanium ore (rutile, titanium slag, or ilmenite), magnesium, chlorine, electric energy, inert gas (helium or argon) and fuel. Major requirements per pound of titanium sponge are 3.5 to 4.0 pounds of ilmenite (or rutile or titanium slag of equivalent titanium content), 5 pounds of chlorine, 1.25 pounds of magnesium, and about 9 kilowatt-hours of electric energy. If the magnesium and chlorine are regenerated, the requirement for magnesium is about 0.2 pound and for chlorine about 1 pound, and the energy required increases to about 15 kilowatt-hours per pound of titanium sponge.

Titanium-sponge metal (commercially pure) is quoted at $5 per pound. Mill shapes sell from $6 to about $20 per pound. Prices will decrease with expanded production and through improvement of existing processes or development of new processes. Even at present prices there is a great demand for the metal.

The Tariff Act of 1930 set the rate on titanium metal at 25 percent ad valorem; this rate was decreased to 20 percent in 1951.

As of May 1954 the Office of Defense Mobilization has authorized an annual production capacity of 32,000 tons for defense needs with an additional 3,000 tons to be used for new commercial products.

A melting capacity of 37,500 tons has been authorized to process sponge and scrap into ingot. A revolving inventory of 4,000 tons has also been authorized to allow for fluctuations in production and consumption.

As of the above date 5 contracts for production are in operation; 6 contracts are under negotiation and 6 applications are being processed.

All the companies with which the Government is dealing are highly responsible and possess skilled technical staffs, so that it is entirely possible that an annual production of 150,000 tons can be reached in the next few years. Many witnesses have testified this amount could be used now if it were available.

The commercial titanium-bearing ores are ilmenite and rutile. The United States is currently the world's largest producer of ilmenite. About 70 percent of United States ilmenite requirements was produced domestically in 1953 (80 percent in 1952) with the remainder coming from India and in increasing amounts (as titanium slag) from Canada. Rutile, the other commercially important titanium ore, is at present not produced domestically in sufficient quantity to meet United States requirements. About two-thirds of present domestic supply is imported from Australia, the major rutile producing country and only country shipping rutile to the United States for the past 5 years.

Titanium dioxide pigments, like titanium metal, possess the advantages of ample domestic ore supply and outstanding characteristics. The increasing supply of titanium dioxide pigments can be expected to replace partially the use of white lead and zinc pigments.

Substitutes for rutile for use in welding-rod coatings, including those that have been used, or are being tested, and that show promise as at least partial substitutes, include ilmenite, manufactured TiO_2, brookite, Reesite, Tanarc, and high titania slag. Ilmenite and titanium slag offer the best promise at present as substitutes for rutile in the production of titanium metal.

The minerals of titanium are known to be widely distributed in the United States and Canada. The assurance of self-sufficiency in the Western Hemisphere by efficient utilization of these minerals requires a determination of their location, quantity, grade, and the development of methods for economically recovering the titanium value. The recovery of titanium as a byproduct or the recovery of byproduct minerals is a necessary part of this program. Research is indicated on the development of technology to permit the use of substitutes that are in ample domestic supply for rutile in the production of titanium metal, welding rod coatings, and other products. The cost factor is necessarily important in the consideration of substitutes for rutile.

Western Hemisphere: Can be entirely self-sufficient in ilmenite.

Substitutes: Aluminum and stainless steels only partly; has no equal for light weight, strength, and resistance to corrosion.

Uses: Aircraft, chemical equipment, structural uses.

See page 318, part 1, for details.

TUNGSTEN

1. *United States*

(*a*) *Production and consumption*—

[Thousands of pounds metallic tungsten content]

	1943	1952	1953
Production	11,368	7,233	[1] 8,700
Consumption	19,500	8,634	[1] 8,000

[1] Estimate.

(*b*) *Present position.*—Production has been stimulated by price incentive under the Government's purchase program of $63 per short-ton unit (20 pounds). The program has been extended to July 1, 1958, by act of Congress. Production is now sufficient to meet peacetime consumption, but would not be enough to meet a war emergency.

Extreme price fluctuations have characterized the industry. For the first time in the history of the industry, the Government's purchase program has permitted an orderly development of mining. It is hoped that the industry will not be permitted to die, as it has twice before, after the termination of the program.

2. Western Hemisphere

The Western Hemisphere is now producing far more tungsten than it consumes; this self-sufficiency was attained by long-term contracts. Production in 1953 is estimated at 19 million pounds.

In 1952 the United States produced 12.5 percent of world production, Bolivia and Brazil were substantial producers. The total Western Hemisphere production was 27 percent of world production—excluding Russia and the satellite countries.

In the past the Western Hemisphere has been self-sufficient in peacetime and there is every reason for believing that it can continue to remain so in the future.

3. World position

It is believed that China has the world's largest known high-grade reserves of tungsten ores with a rated capacity of 50 percent of the world supply. If peace should come to southeast Asia, the free world

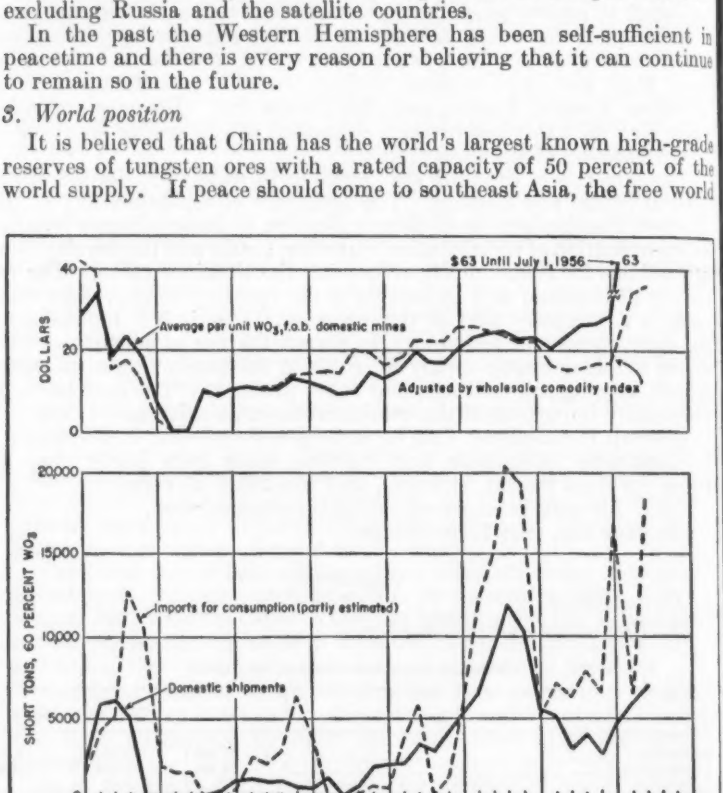
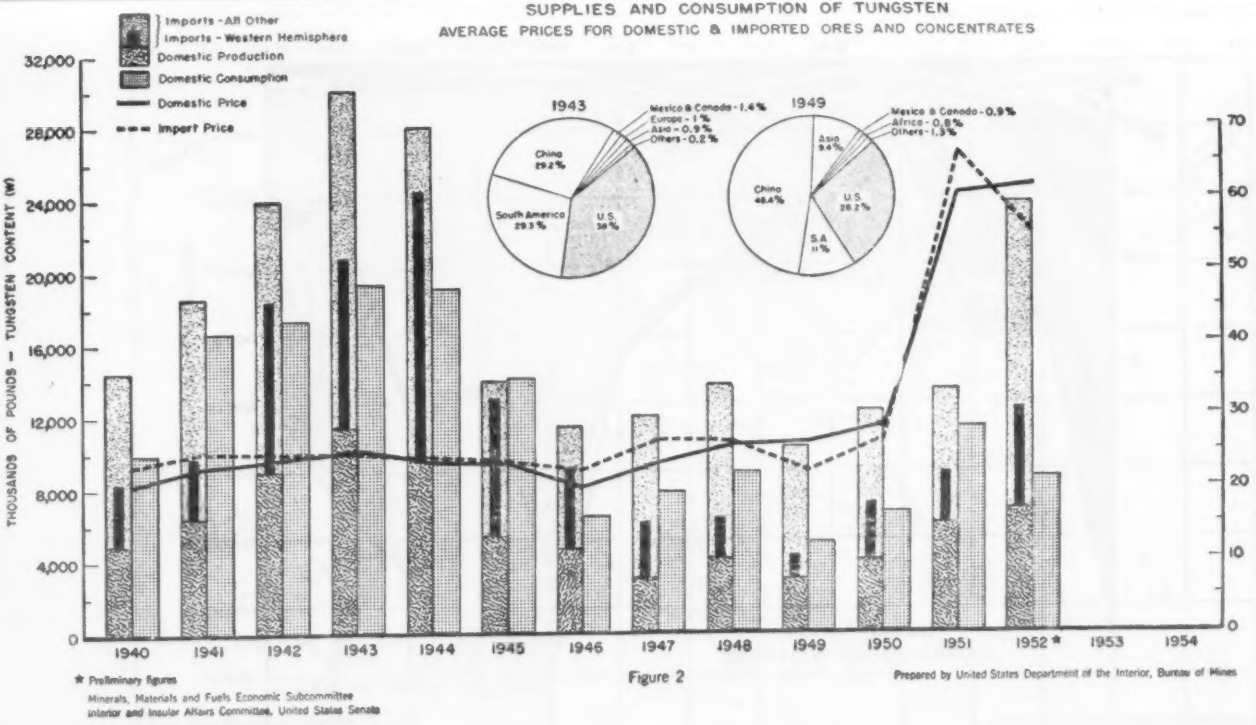


FIGURE 1.—Trends in domestic shipments, imports, and average price of tungsten ore and concentrates, 1915–52

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of Mines

SUPPLIES AND CONSUMPTION OF TUNGSTEN
AVERAGE PRICES FOR DOMESTIC & IMPORTED ORES AND CONCENTRATES



* Preliminary figures

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

Prepared by United States Department of the Interior, Bureau of Mines

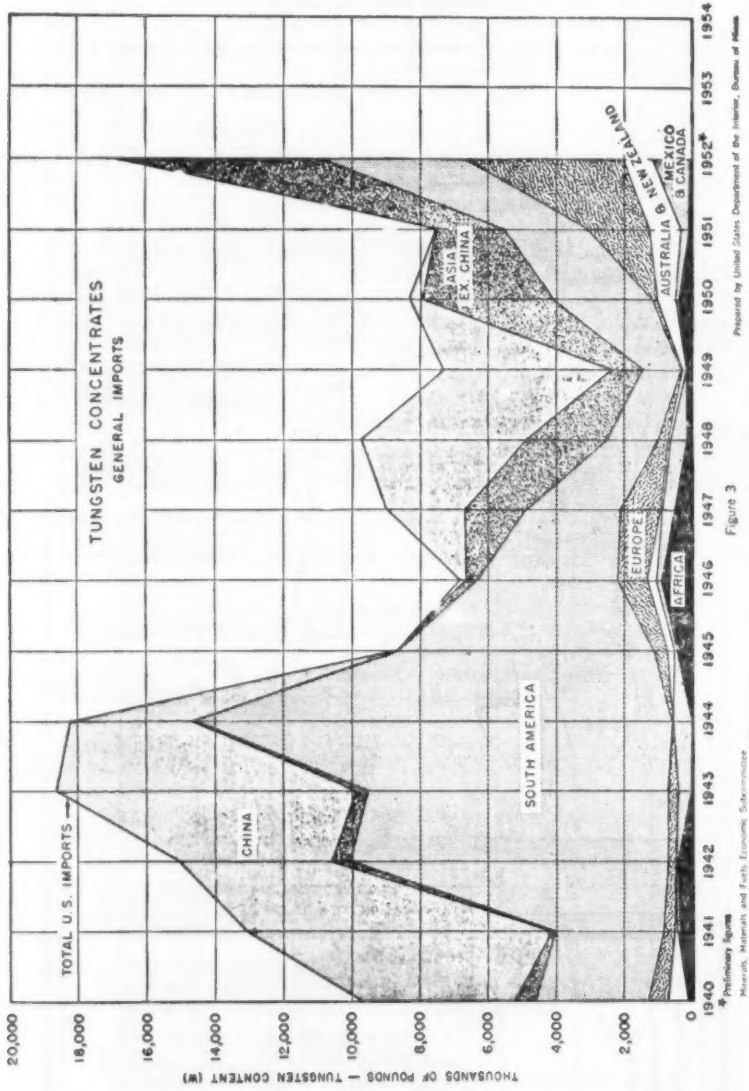
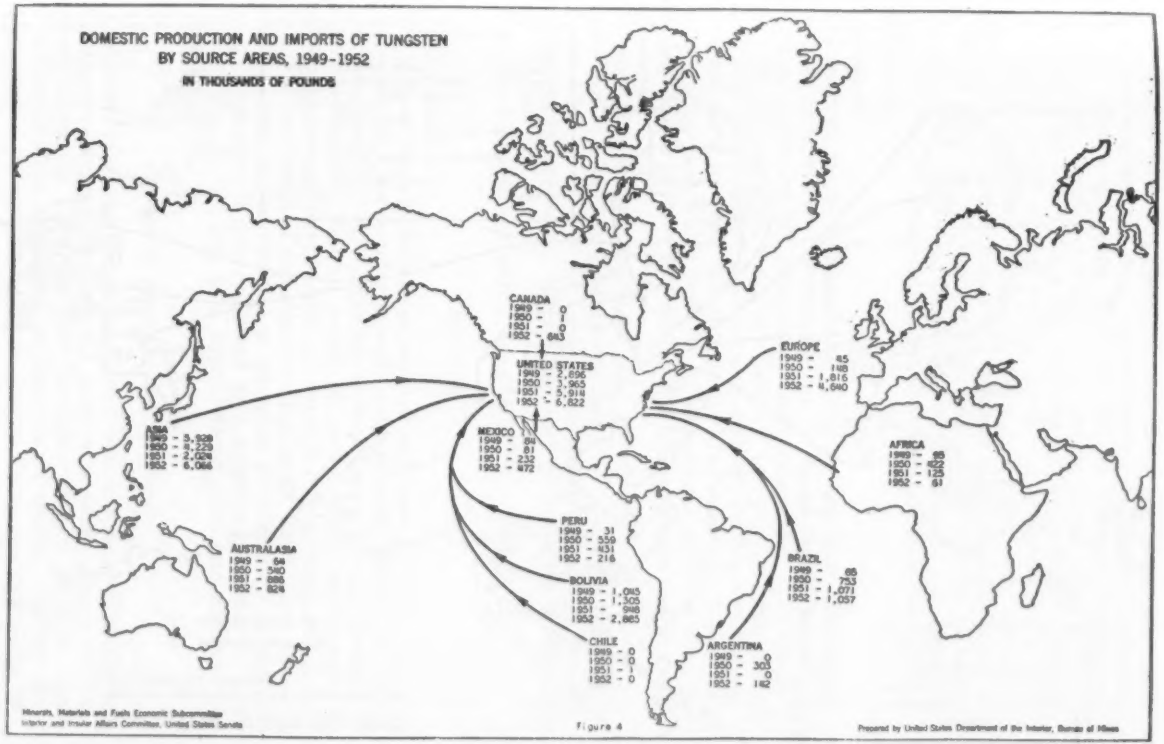

TUNGSTEN CONCENTRATES
GENERAL IMPORTS
TOTAL U.S. IMPORTS
CHINA
SOUTH AMERICA
ASIA EX. CHINA
EUROPE
AFRICA
AUSTRALIA & NEW ZEALAND
MEXICO & CANADA
THOUSANDS OF POUNDS — TUNGSTEN CONTENT (W)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952*
1953
1954
*Preliminary figures
Minerals Materials and Fuels Economic Subcommittee
Prepared by United States Department of the Interior, Bureau of Mines

Figure 3


DOMESTIC PRODUCTION AND IMPORTS OF TUNGSTEN
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF POUNDS
CANADA
1949 - 0
1950 - 1
1951 - 0
1952 - 643
UNITED STATES
1949 - 2,896
1950 - 3,965
1951 - 5,918
1952 - 6,822
EUROPE
1949 - 45
1950 - 148
1951 - 1,816
1952 - 4,640
ASIA
1949 - 5,329
1950 - 9,229
1951 - 2,529
1952 - 8,066
MEXICO
1949 - 69
1950 - 81
1951 - 232
1952 - 872
AFRICA
1949 - 65
1950 - 122
1951 - 125
1952 - 61
PERU
1949 - 31
1950 - 559
1951 - 431
1952 - 216
AUSTRALASIA
1949 - 64
1950 - 540
1951 - 888
1952 - 824
BOLIVIA
1949 - 1,015
1950 - 1,305
1951 - 598
1952 - 2,865
BRAZIL
1949 - 65
1950 - 753
1951 - 1,071
1952 - 1,057
CHILE
1949 - 0
1950 - 0
1951 - 1
1952 - 0
ARGENTINA
1949 -
1950 - 303
1951 - 0
1952 - 182
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Figure 4
Prepared by United States Department of the Interior, Bureau of Mines

TUNGSTEN SUPPLIES-1952
WESTERN HEMISPHERE CAN BE SELF-SUFFICIENT WITH INCENTIVE PROGRAMS
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 33.3%
SEA ROUTES 66.7%
Western Hemisphere Coastal 17.9%
Trans Atlantic 19.8%
Trans Pacific 29.0%
Thousands of Pounds
Percent
1,190 Argentina, Brazil 5.1
3,101 Bolivia, Peru 12.9
7,937 Canada, Mexico, United States 33.3
5 Finland —
24 Fr. E. Africa, Un. So. Africa 0.1
37 Belg. Congo 0.2
824 Australia 3.5
2,141 Burma, Malaya, Thailand 9.0
3,925 China, Hong Kong, Korea 16.5
4,632 Portugal, Spain 19.5
TOTAL SUPPLY 23,828,000 POUNDS 100.0
FINLAND
SPAIN
PORTUGAL
BRITISH EAST AFRICA
BELGIAN CONGO
UNION OF SOUTH AFRICA
CANADA
UNITED STATES
MEXICO
BRAZIL
PERU
BOLIVIA
ARGENTINA
KOREA
CHINA
HONG KONG
THAILAND
BURMA
MALAYA
AUSTRALIA
Prepared from data supplied by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee United States Senate

will be flooded with tungsten produced under the lowest standards of living and wages in the world, approximating slave-labor conditions. This can have a damaging effect on all the Western Hemisphere countries unless a definite congressional policy is laid down.

Between 1934 and 1951 prices have ranged between $14 and $85 per unit, and at the present writing, April 1954, the price is $20 duty paid. Production from the slave mines of Asia must not be permitted to destroy the hard-won high-wage economy of the industry either of the United States or the Western Hemisphere. Nor should the safety and security of the Nation be forced into dependence for this most critical material on an area that has been notoriously unreliable and antagonistic.

4. Comments

Ore reserves, in the United States, from the long-term standpoint, have been improved by the Government purchase program which has offered an incentive for prospecting and exploration. The discovery by the Bureau of Mines of the Yellow Pine tungsten mine during World War II more than repaid the cost of all the drilling and exploration work done by both the Bureau of Mines and the Geological Survey during that whole period. More research must be done on the beneficiation of low-grade ores. The United States can be made self-sufficient.

Western Hemisphere: Self-sufficient.

Substitutes: Molybdenum for some uses.

Uses: Alloy in steels requiring hardness and strength at high temperature, as in tool steels, projectiles, lamp filaments, carbide tools and electrical contacts.

See page 108, hearings, part 1, for details.

VANADIUM

1. United States

The United States is the largest producer and consumer of vanadium in the world; but, for security reasons, publication of figures has been suspended since 1947 at the request of the Atomic Energy Commission. The Colorado Plateau, which comprises chiefly southwestern Colorado and southeastern Utah but extends into Arizona and New Mexico, is the center of vanadium-ore mining in the United States. Some vanadium is recovered as a byproduct of phosphate mined in Idaho. Vanadium is also recovered as a byproduct of chrome ore at Glen Falls, N. Y., and as a byproduct of petroleum residues at Woodridge, N. J.

DEGREE OF UNITED STATES SUFFICIENCY

Production of vanadium in the United States is more than ample for industry requirements and the surplus is being placed in the strategic stockpile. Despite this favorable supply position, the production of Peru is shipped to the United States. By far the greater part of the production in the United States is a byproduct or coproduct of uranium and the nature of the ore is such that vanadium will be produced in greater quantity than uranium. Also, the program of AEC makes economic ores lower in grade than could previously be mined. Furthermore, additional plants primarily for pro-

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ducing uranium are under construction or projected. For these reasons, the potential domestic production of vanadium, plus imports from Peru, is expected to continue to be in excess of industry requirements.

2. Western Hemisphere

Vanadium, although a strategic metal, is the least critical of all the alloying elements used for steel manufacture. Supplies of vanadium usually are ample to meet the requirements of the United States, except, as in 1941–43 an apparent tightness of vanadium was caused primarily by its substitution in steels, containing chromium and vanadium, for unobtainable nickel.

NEW POSITION IN VANADIUM—RESEARCH ON NEW USES

3. Comments

The withholding of vanadium produced as a coproduct with uranium is creating a stockpile and ultimately an artificial economic situation. New uses are needed. Vanadium has been used mainly as an alloying element for other metals. Little is known about properties of pure vanadium or vanadium alloyed with other metals. It is in the same position that titanium and zirconium were when the Bureau of Mines commenced investigating them. It can be expected to find many uses and perhaps substitute for some of the more strategic metals. Here is a likely candidate for "another molybdenum" (or titanium or chromium) well worth study before the stockpile becomes an economic headache.

SUBSTITUTES AND REPLACEMENTS

It is only necessary to resort to substitutes for vanadium when it is substituted in large quantity for other metals. Molybdenum or molybdenum-silicon steels with a grain-refining addition of aluminum are equally serviceable substitutions in the great majority of cases where vanadium steels have been substituted for SAE steels. An extreme example for saving vanadium is its omission from rolled tank armor and the use of manganese-titanium steel for high-strength plate in place of a vanadium-containing steel. Platinum can be used in place of vanadium as a catalyst.

See page 119, hearings, part 1, for details.

United States entirely self-sufficient.

ZINC

1. United States

(*a*) *Production.*—Domestic mine production: Average 1948–52 period, 638,000 short tons; 1953, 534,000 short tons.

The total supply, including domestic secondary, was 1,289,000 tons for 1952.

(*b*) *Consumption.*—Average, 1948–52 period, 976,000 short tons; 1953, 1,090,000 tons. Net imports, 327,000 tons; 1953, 654,000 tons.

2. Western Hemisphere

The Western Hemisphere is entirely self-sufficient and produced 53 percent of the world total output in 1952. United States reserves are sufficient to support an annual production of approximately 700,000 tons a year with a suitable price incentive. The potential for new discoveries in the Western Hemisphere is good.

The price declined from 19.5 cents a pound to 9.25 cents in less than 2 years. The mine production rate dropped from 63,000 tons per month in 1952 to 38,000 tons in December 1953.

The industry must have protection on a fair and reasonable basis in order to survive.

3. Comments—United States position

In 1952 imports in terms of recoverable zinc were 497,000 tons and through the first 7 months of 1953 had already reached 288,000 tons in ores and concentrates and 181,000 tons as slab zinc or an indicated rate of 732,000 tons of recoverable zinc from imports for the year.

Although the United States in the period 1940–52 imported 5,330,000 tons of zinc it should be noted that 92 percent of that quantity was derived from neighboring countries in the Western Hemisphere, with 42 percent coming from Mexico, 35 percent from Canada, and 15 percent from Central and South America.

United States aid to develop foreign mines, low tariff, devaluation of foreign currencies, and wages only a slight fraction of domestic wages have combined to flood the domestic market, resulting in the closing of many mines and the dislocation of dependent communities.

The greater part of the imports during 1953 came from stocks that had been accumulated in foreign countries during the period of fixed-price ceilings in the United States. Since control of zinc was removed foreign metal and concentrates began to flow in, as demand in the foreign countries was not sufficient to absorb their current production plus the stocks they had accumulated.

Operations as of January 1, 1954, are at the rate of 450,000 tons a year. Very few mines in the United States can pay the high labor and supply costs and break even. A number of mines are continuing to operate at a loss in order to hold their organizations together and to keep their mines in good physical condition, but this cannot continue for long. A mine once shut down cannot be reopened except at high cost in time and money, and it represents a dead loss to the Nation's economy and security in every way.

Western Hemisphere: Self-sufficient.

Substitutes: None needed.

Uses: Galvanizing, brass, alloys, die castings.

See page 191, hearings, part 1, for details.

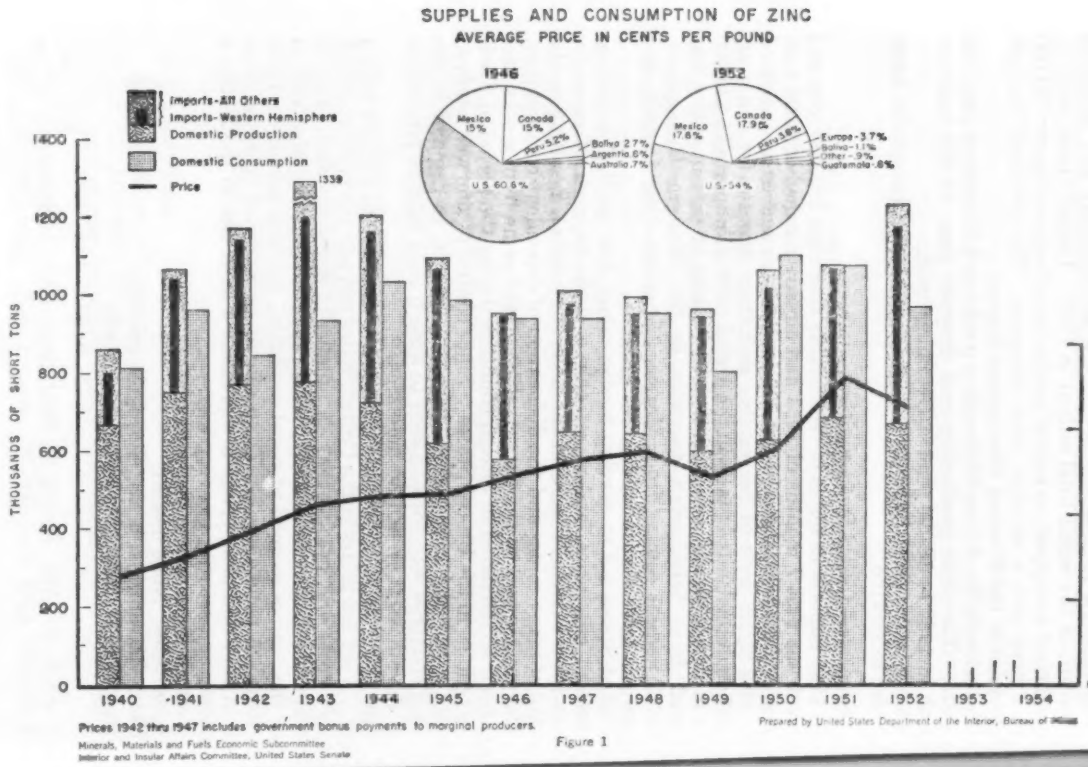
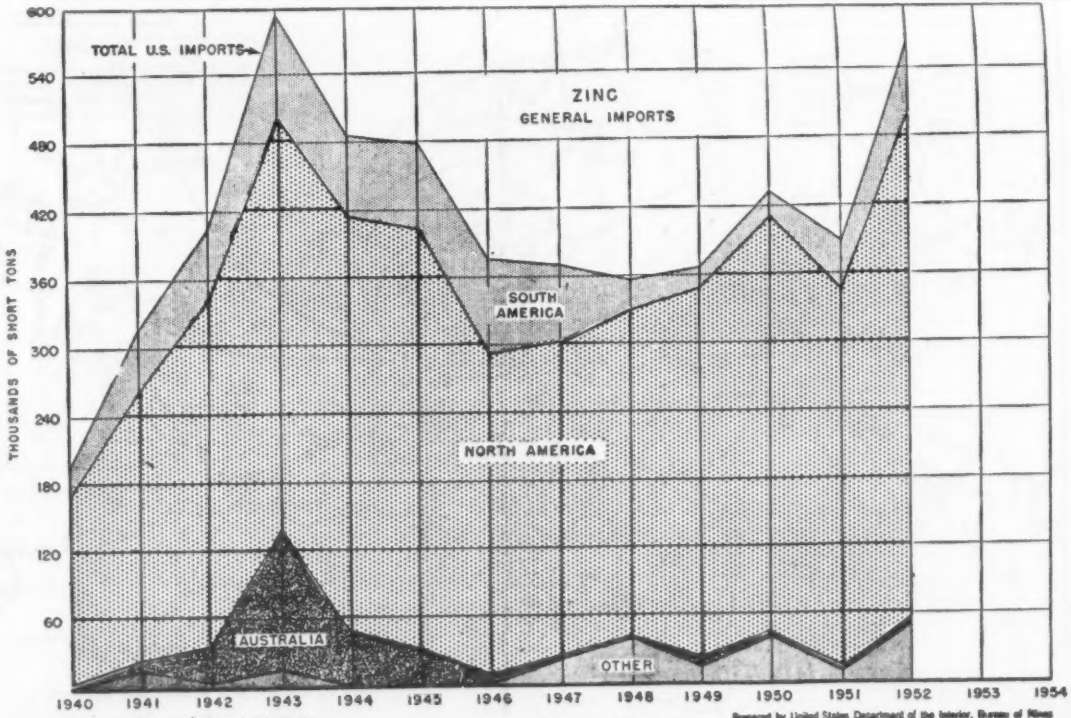

SUPPLIES AND CONSUMPTION OF ZINC
AVERAGE PRICE IN CENTS PER POUND
1946
1952
Imports-All Others
Imports-Western Hemisphere
Domestic Production
Domestic Consumption
Price
Mexico 15%
Canada 15%
Peru 5.2%
Bolivia 2.7%
Argentia 8%
Australia .7%
U.S. 60.6%
Mexico 17.6%
Canada 17.9%
Europe - 3.7%
Bolivia - 1.1%
Other - 9%
Guatemala - .6%
U.S. - 54%
1339
THOUSANDS OF SHORT TONS
CENTS PER POUND
0
200
400
600
800
1000
1200
1400
0
5
10
15
20
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
Prices 1942 thru 1947 includes government bonus payments to marginal producers.
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared by United States Department of the Interior, Bureau of

Figure 1

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 1

Prepared by United States Department of the Interior, Bureau of Mines



Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 2

Prepared by United States Department of the Interior, Bureau of Mines

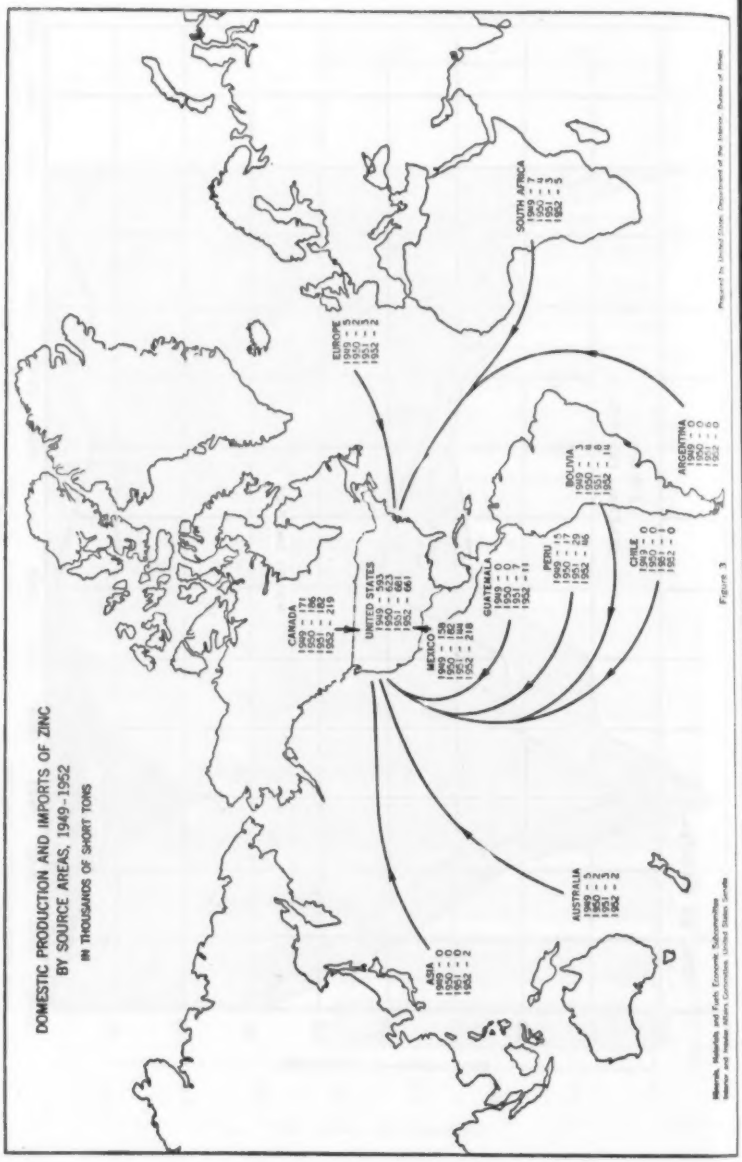
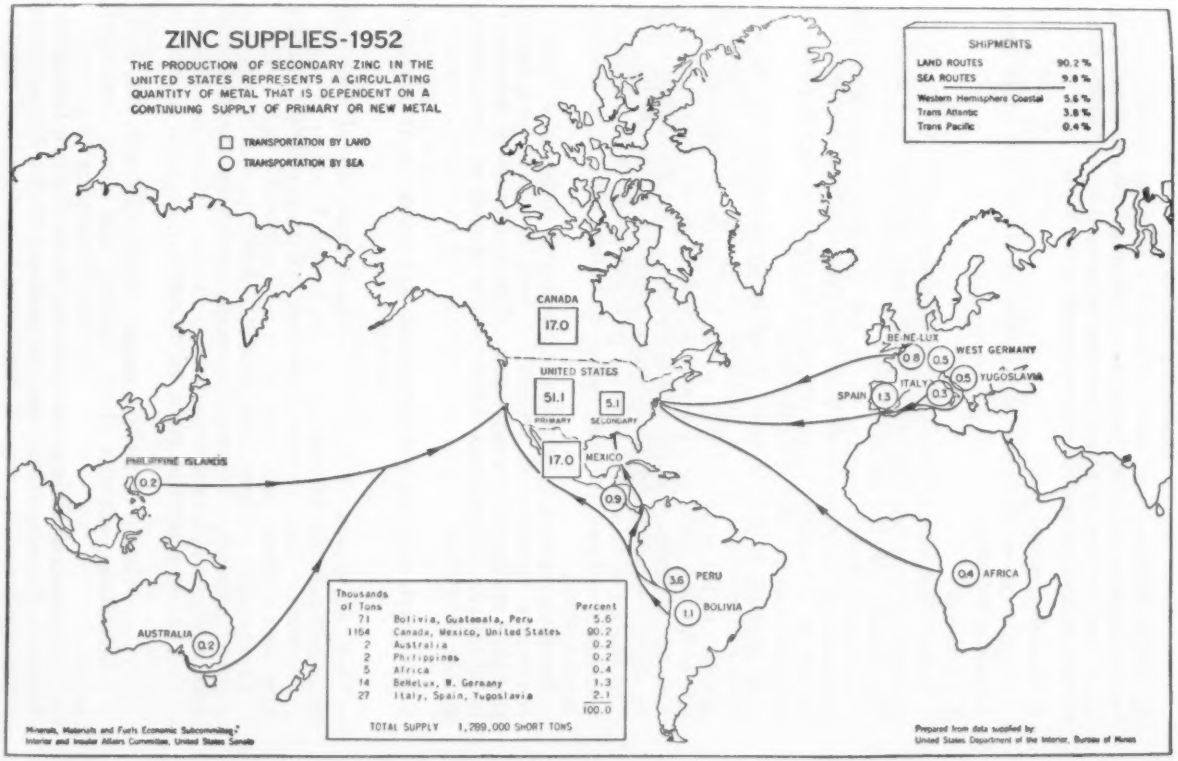

DOMESTIC PRODUCTION AND IMPORTS OF ZINC
BY SOURCE AREAS, 1949-1952
IN THOUSANDS OF SHORT TONS
Prepared by United States Department of the Interior, Bureau of Mines
Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate

Figure 3


ZINC SUPPLIES-1952
THE PRODUCTION OF SECONDARY ZINC IN THE UNITED STATES REPRESENTS A CIRCULATING QUANTITY OF METAL THAT IS DEPENDENT ON A CONTINUING SUPPLY OF PRIMARY OR NEW METAL
TRANSPORTATION BY LAND
TRANSPORTATION BY SEA
SHIPMENTS
LAND ROUTES 90.2 %
SEA ROUTES 9.8 %
Western Hemisphere Coastal 5.6 %
Trans Atlantic 3.8 %
Trans Pacific 0.4 %
CANADA 17.0
UNITED STATES
51.1 PRIMARY
5.1 SECONDARY
17.0 MEXICO
0.9
PHILIPPINE ISLANDS 0.2
AUSTRALIA 0.2
PERU 3.6
BOLIVIA 1.1
BE-NE-LUX 0.8
WEST GERMANY 0.5
YUGOSLAVIA 0.5
ITALY 0.3
SPAIN 1.3
AFRICA 0.4
Thousands of Tons | | Percent
71 | Bolivia, Guatemala, Peru | 5.6
1164 | Canada, Mexico, United States | 90.2
2 | Australia | 0.2
2 | Philippines | 0.2
5 | Africa | 0.4
14 | BeNeLux, W. Germany | 1.3
27 | Italy, Spain, Yugoslavia | 2.1
100.0
TOTAL SUPPLY 1,289,000 SHORT TONS
Minerals, Materials and Fuels Economic Subcommittee, Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by United States Department of the Interior, Bureau of Mines

ZIRCONIUM-HAFNIUM

1. United States

Consumption.—United States consumption is in the order of 40,000 short tons per year, of which less than 10 percent is used in the manufacture of zirconium and hafnium metals and alloys.

2. Western Hemisphere

Large reserves of zircon are known in Brazil and other South American countries.

3. Comments

United States mine capacities and known reserves of zircon, the principal source mineral of zirconium and hafnium, are adequate. The United States is self-sufficient.

Zirconium metal, because of its low thermal-neutron absorption cross section, corrosion resistance, and structural properties, is used largely as a material of construction in atomic energy applications. Hafnium also has atomic energy uses.

At present, zirconium metal is not in short supply but its widespread commercial use is curtailed by a high price. The major problem of the metal industry is the production of sufficient ductile zirconium and hafnium at a low enough price to make their commercial utilization economically attractive. This problem is similar to that encountered by the titanium industry during its inception. The Bureau of Mines has been the principal producer of these metals and has developed the magnesium reduction method, a multistep batch process.

Research directed toward lower production costs and to devise a continuous metallurgical process for both zirconium and hafnium should be continued for many years. The application of these metals in alloys and the physical characteristics of each of these products should be studied.

NONMINERAL CRITICAL AND STRATEGIC MATERIALS OF AGRICULTURAL ORIGIN

There are groups of 35 critical stragetic materials of nonmineral origin, classified as follows:

Chemicals.—Agar, emetine, hyoscine, opium, pyrethrum, quinine, quinidine, shellac.

Cordage fibers.—Abaca, sisal, henequen, jute.

Forest products.—Tanning (chestnut, quebracho, wattle), cork, teak, mahogany, lignum vitae, balsa.

Oils.—Castor, coconut, palm, sperm, tung.

Rubber.

Textiles.—Cotton (extra long staple), cotton (Upland), silk, wool.

Miscellaneous.—Bristles (hog), feathers and down (waterfowl), pepper.

All of these materials can be produced in the Western Hemisphere. Many of the commodities can be produced in the United States; others which require a tropical climate can be produced in Central and South America; synthetics and replacements and substitutes are available for the balance.

Complete details on each are given in part 9 of hearings, page 443.

AGAR

Uses: Major use is as a bacteria-culture medium although it has other uses in the food industry, in dentistry, pharmacy, medicine, and as an emulsifier in some industrial applications.

Substitutes: So far as we know, no entirely satisfactory substitutes have been developed.

Western Hemisphere: Can become self-sufficient.

EMETINE (IPECAC)

Uses: Principally in the treatment of amoebic dysentery, particularly in cases involving liver complications.

Substitutes: Chloroquin, diodequin, along with aureomycin and terramycin.

Western Hemisphere: Could be self-sufficient.

HYOSCINE (SCOPOLAMINE)

Uses: Medicinal control of motion sickness; in anaesthetic compounds; treatment of Parkinson's disease.

Substitutes: Dramamine may be used for motion sickness, but produces an undesirable drowsiness and possible side effects. Other drugs are not adequate substitutes for hyoscine in other uses.

Western Hemisphere: Can become self-sufficient.

OPIUM

Uses: As a source of morphine, codeine, and other narcotics for medicinal use.

Substitutes: Several synthetic pain-relieving compounds have been developed at times from nonvegetable sources, but none of these, apparently, have been fully accepted for all purposes by the medical profession as a whole.

Western Hemisphere: Can become self-sufficient.

PYRETHRUM

Uses: A principal ingredient of insecticides for the control of disease-bearing insects.

Substitutes: There has been much work done recently to develop new insecticides of which allethrin, developed by Department of Agriculture chemists, is the nearest substitute to pyrethrum. Pyrethrum still has special uses and there has not been a great reduction in pyrethrum requirements because of the development of new insecticides.

QUININE

Uses: As an antimalarial medicine.

Substitutes: Quinacrine hydrochloride (atabrine), chloroquin, and palubrine. Self-sufficient in substitutes.

QUINIDINE

Uses: For the medicinal treatment of auricular fibrillation (irregularly beating heart).

Substitutes: None.

Western Hemisphere: Can become self-sufficient.

SHELLAC

Uses: As a sealant for primers in shells and cartridges; protective coating for wood patterns and electrical insulation papers; adhesive for binding mica, abrasive wheels, electronic tubes, and light bulbs. It is also used in printing and engraving inks, for stiffening of felt in hats, in phonograph records, and for coating leather and textiles.

Substitutes: Synthetic resins can be used instead of shellac for some purposes. Various protective coatings using petroleum, coal tar, and agricultural products as starting points have been developed and are readily accepted as substitutes for shellac in many applications.

Western Hemisphere: Can be self-sufficient.

CORDAGE FIBERS

The United States imports annually for domestic use approximately 400 million pounds of tropical hard fibers and 800 million pounds of semitropical soft fibers. These fibers include abaca, sisal, henequen, jute, kapok, burlap and other fibers produced from tropical or semitropical plants, none of which are grown commercially in this country.

Abaca

Uses: This fiber is used almost exclusively in marine cordage and nets which are exposed to sea water because of its high resistance to this form of deterioration. It is also used for making the strong flexible cable used in oilwell drilling, high performance ropes, wire rope centers, and pulp for specialty paper.

Substitutes: Sisal and henequen are substitutes which can be used in an emergency although they have a considerably less service expectancy. Cable and rope would generally have to be larger and heavier to perform the same duty.

Western Hemisphere: Can become self-sufficient.

Sisal

Uses: Farm rope; baler, binder, and wrapping twine; upholstery and padding; wire rope centers and reinforcement for paper and plastics.

Substitutes: Henequen, istle, coir, cabuya, cantala, maguey, and canton—all hard fibers. Hemp, jute, kenaf, and cotton in the soft fiber group.

Western Hemisphere: Can be self-sufficient.

Henequen

Uses: Agricultural binder and baler twine, rope, and cordage.

Substitutes: Sisal and abaca.

Western Hemisphere: Can become self-sufficient.

Jute

Uses: Burlap, bagging, cotton-bale wrapping.

Substitutes: It has been demonstrated that kenaf is a satisfactory substitute for jute in the manufacturing of burlap and twine. It was produced on a commercial scale in south Florida as well as in other areas of the Western Hemisphere in 1950–52.

Other important cordage fibers are kenaf, sansevieria, hemp, and phormium. The Western Hemisphere can be self-sufficient in all.

FOREST PRODUCTS

Vegetables tannins

Uses: Chestnut—principally tanning of hides and skins; to lesser degree in treating boiler water and in chemical industry. Wattle—same as chestnut tanning. Quebracho—tanning of hides and skins and mud treatment in drilling oil and gas wells.

Substitutes: Many advances have been made in the development of chrome tans and other chemical tanning processes. Chemical tanning compounds are utilized extensively; however, apparently there has not been developed a material that can completely take the place of vegetable tannins.

A method of extracting high-grade tannin from canaigre (see question 1) has been developed and when tanned in experimental leathers has proven to be as satisfactory as imported vegetable tannins such as quebracho.

Western Hemisphere: Can be self-sufficient.

OTHER FOREST PRODUCTS

Cork, teak, mahogany, lignum vitae, and balsa

Western Hemisphere: self-sufficient in either original material or substitutes.

CASTOR OIL

Uses: It is one of the most widely used industrial vegetable oils, either as such or in the form of derivatives, having applications in paints and varnishes, soaps, nylon plastic, synthetic resins, hydraulic brake fluids, waxes, ointments, and in the preparation of cotton textiles to be dyed. It is an excellent lubricating and cutting oil having a stable viscosity over a wide temperature range.

Substitutes: Other oils (tung, linseed, soybean) can replace dehydrated castor oil in most paint and varnish applications. Chemical substitutes can be adapted for use as hydraulic fluid. Azelaic acid, produced from animal fats, appears to be a possible substitute for sebacic acid which is required for the nylon plastic outer coating on combat field wire and in synthetic lubricants for jet engines. For the several hundred miscellaneous uses of castor oil, semisatisfactory substitutes can be utilized if necessary.

COCONUT OIL

Uses: In the United States coconut oil is used principally for laundry, household, and toilet soaps; specialty food products, lauryl alcohol, synthetic detergents, disinfectants, and as a source of coconut oil fatty acids for napalm.

Substitutes: Oils which compete closely with coconut oil are the African palm and babassu oil.

Babassu grows wild in Brazil.

Western Hemisphere: Can become self-sufficient.

PALM OIL

Uses: In the United States palm oil is now used almost entirely as a fluxing dip in the manufacture of tin and terneplace and the cold rolling of steel.

Substitutes: A product has been developed from inedible fats now in surplus, which is has been demonstrated in practical tests will serve as a palm oil substitute for lubrication in the cold rolling of steel and in the "hot-dip" tinplating of steel sheets.

Also animal fats such as lard, tallow, and white grease (a grade of hog fat) when slightly modified are satisfactory tinning oils for the "hot-dip" tinplating.

Western Hemisphere: Can become self-sufficient.

SPERM OIL

Substitutes: There has been considerable industrial interest in the oil from the seed of a wild shrub (simmondsia) which grows native in southwestern United States and adjacent Mexico. It has been said that the oil obtained from this plant's seed so closely approximates sperm-whale oil that it could, if available, almost completely replace sperm-whale oil on the market. The Department of Agriculture has asked for funds to undertake research on the crop development of this oil plant and to investigate the commercial possibilities of economically substituting simmondsia oil for sperm-whale oil.

Western Hemisphere: Good substitute can become self-sufficient.

TUNG OIL

Uses: Tung oil is at present used almost exclusively as a high quality drying oil primarily in paints and varnishes.

Substitutes: The most work that is being done is to find new uses for the oil so as to increase its consumption. In former years, 85 percent of all tung oil was used in the protective coating industries. In recent years, the development of new material such as resins and latexes has made possible new protective coating formulas that replaced those formerly using tung and other oils. This new development has resulted in substantial reductions in the requirement for not only tung oil but other vegetable and animal drying oils.

Western Hemisphere: Can become self-sufficient.

NATURAL RUBBER

Hevea rubber is native to South America and can be grown anywhere in the American tropics where there is suitable soil. In general, it is limited to altitudes less than 2,000 feet and areas with a well-distributed rainfall of over 70 inches per year. There are other rubber plants that are native to the American tropics but practically all of our rubber now comes from Hevea, mostly from cultivated trees in the East.

Western Hemisphere: Can be self-sufficient in natural and self-sufficient in synthetic rubber.

Substantial quantities of guayule rubber can be produced in the United States. The cost of production would be well above the present price of 20.5 cents per pound for imported natural rubber. Yield improvement through continued research could reduce the cost. Guayule rubber would meet sales resistance on the part of rubber manufacturers because of its past reputation of poor quality. It can now be produced in a quality equal to and for some uses superior to that of imported natural rubber.

COTTON, EXTRA LONG STAPLE

Uses: Egyptian Karnak or equivalent is required for high-speed sewing thread and fabrics which are to be coated such as balloon and airplane cloth. It is also used as fine wire insulation and for making sleeping bag and parachute harness fabrics, Byrd cloth for Arctic clothing, and "typewriter ribbon" tape.

Western Hemisphere: Can become self-sufficient.

SILK

Uses: The principal uses of silk are wearing apparel, surgery, parachutes and powder bags.

The United States has not been able to produce silk on an economical basis to meet the competition of foreign production. This is true also of other Western Hemisphere countries with the exception of Brazil. A small amount of raw silk was produced in Brazil in 1945–46, of which small quantities were exported to the United States.

Substitutes: Manmade fibers such as nylon, rayon, acetate, have largely replaced silk for wearing apparel. Nylon has replaced silk in parachutes, partially acetylated. Cotton is being used for powder bags and other material in surgery, but cannot be used in all types and instances.

The Bureau of Agricultural and Industrial Chemistry's Southern Regional Research Laboratory at New Orleans is continuing work on partially acetylated cottons as a possible substitute for silk in cartridge cloth. Ordnance tests have shown this chemically modified cotton to perform satisfactorily as a silk substitute for cartridge cloth. Through close cooperation with Army Ordnance, Navy Bureau of Ordnance and a large textile finishing firm, commercial quantities of acetylated cotton fabric are being prepared for large-scale firing trials.

WOOL

Substitutes: Considerable research has been and is being conducted in the man-made fiber field, and the use of such fiber in the manufacture of items for which wool traditionally has been considered the most desirable fiber has been increasing. The capacity to produce such fibers in the United States has increased rapidly in the past few years and further increases are planned for 1954.

The military services are at present experimenting with blends of wool and other fibers, particularly the man-made fibers, for some military items. Such fibers can and will be used in the future for the manufacture of military items, however, the extent is conjectural.

Manufacturers of both old and the newly developed man-made fibers are continually striving to improve their product. As such fibers are improved in quality their competition with wool in both military and civilian apparel items is likely to increase.

Western Hemisphere: Can be self-sufficient, and United States production can be materially increased under proper policies adopted by Congress.

HOG BRISTLES

Uses: Paint, varnish, and industrial brushes.

Substitutes: Production of a bristle fiber suitable for paint brushes from the regenerated keratin of chicken feathers has been worked out on a laboratory scale. Commercial production of the new fiber is scheduled to begin about June 1954. The keratin bristle can be cut to any desired length to meet brush specifications. About 100 million pounds waste feathers are produced annually at large processing plants.

Casein has been used for production of bristles, but commercial production of this bristle has been discontinued.

Tapered nylon bristles ranging from 3 to 4½ inches in length and level-end nylon filament are used as substitutes to a fair degree. Horsehair is used but primarily as an extender, and Neoceta. However, synthetic bristles cannot be used in all instances for they are harmed by some paint solvents.

Western Hemisphere: Can become self-sufficient in substitutes.

FEATHERS AND DOWN, WATERFOWL

Uses: For stuffing Army and Marine field sleeping bags (40 percent down and 60 percent small feathers); Air Force emergency kit sleeping bags; insulated casualty evacuation bags; medical hospital pillows (10 percent down and 90 percent feathers).

While no suitable substitute for waterfowl feathers and down has as yet been developed for military sleeping bags, for casualty evacuation bags, experiments indicate at least a partial use of synthetic fiber of the acrylic type. For all other uses—wool fleece, kapok, milkweed floss, chicken and turkey feathers are substitutes in varying degrees.

Western Hemisphere: Could become self-sufficient in substitutes.

BLACK PEPPER

A small amount of experimental work has been done by the Department of Agriculture in investigating the possibilities of growing black pepper in Puerto Rico and other tropical countries of the Western Hemisphere. Indications are that the plant will grow well under conditions as found in Puerto Rico and Central America.

Substitutes: There is no real substitute for black pepper as a spice.

Western Hemisphere: Could become self-sufficient.

TABLE 1.—*Strategic raw materials—Current situation, chemicals*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Agar	1952	1,000 pounds	337.2						
Emetine (Ipecac)	1952	do	54.6	1951	1,000 pounds		[1] 103.6		[3]
Hyoscine	1952		[2]					[3]	[3]
Pyrethrum	1953	1,000 pounds	7,739.6	1952	1 million pounds		1	16	17
Cinchona Bark	1953	Pounds	6,804						
Quinine	1952	AOZ	643,912						
Quinidine	1952	AOZ	389,751						
Opium	1952	1,000 pounds	998.6	1952	1,000 pounds			2,352.3	2,352.3

[1] Brazil only.
[2] Not available.
[3] N. s. a.

Sources: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division, Sugar and Tropical Products Branch; U. S. Department of Commerce, Chemicals Division; Office of Defense Mobilization.

TABLE 2.—*Strategic raw materials—Current situation, cordage fibers*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Abaca	1952	1 million pounds	151.5	1952	1 million pounds		34.3	261.4	295.7
Sisal	1952	do	309.3	1952	do		195.8	634.4	830.2
Henequin	1952	do	68.3	1952	do		246.2	[1]	246.2
Jute	1952	do	98.9	1953	do		42.1	2,489.6	2,531.7
Kenaf	1952	do	[2]	1952	do		[1]	[1]	[1]
Hemp (American)	1952	do	1.75	1952	do	[1]	9.0	788.5	797.5
Sansevieria	1952	do	0.35	1952	do		(0.5)	(0.5)	(1.0)
Phormium	1952	do		1952	do		[1]	(18.6)	(18.6)

[1] Negative.
[2] N. s. a.

Source: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division, Sugar and Tropical Products Branch.

TABLE 3.—*Strategic raw materials—Current situation, forest products*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Tannins:									
Chestnut	1952	Short tons	34, 522. 8	1952	Short tons	14, 605	0	96, 980	111, 585
Quebracho	1952	do	138, 084. 7	1952	do	0	264, 796	0	264, 796
Wattle	1952	do	42, 553. 6	1952	do	0	44, 100	165, 900	210, 000
Teak	1952	1,000 board-feet	2, 327	(1)	Cubic meters roundwood			927, 000	927, 000
Mahogany	1952	do	57, 881	(1)	Cubic meters (solid volume)		173, 627	300, 705	474, 332
Lignum Vitae	1952	do	636	(1)	Cubic meters roundwood		4, 260		4, 260
Balsa	1952	do	10, 928	(1)	Cubic meters lumber		37, 200		37, 200
Shellac	1952	Short tons	6, 113. 9	(1 2)	Short tons			61, 462	61, 462

[1] Approximate annual.
[2] Lac (expressed as sticklac).

Sources: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division, Sugar and Tropical Products Branch; U. S. Department of Agriculture, Forest Service, Division of Forest Economics; U. S. Department of Commerce, Leather, Shoes, and Allied Products Division.

TABLE 4.—*Strategic raw materials—Current situation, oils*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Castor	1953	Short tons	63, 568. 9	1953	Short tons	12, 600	95, 403	137, 467	245, 700
Copra and coconut	1953	do	68, 817. 8	1953	do		8, 000	1, 088, 161	1, 096, 161
Palm	1953	do	17, 846. 0	1953	do		1, 000	1, 266, 500	1, 267, 500
Sperm	1953	1,000 gallons	4, 630. 2	1953	do		6, 000	44, 000	50, 000
Tung	1953	Short tons	11, 742. 6	1953	do			144, 250	144, 250

Sources: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division, Sugar and Tropical Products Branch; U. S. Department of Agriculture, FAS, Fats and Oils Division, Commodity Analysis Branch.

TABLE 5.—*Strategic raw materials—Current situation, textiles*

TABLE 5.—*Strategic raw materials—Current situation, textiles*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Cotton:									
Extra long	1953	1,000,000 pounds	56.9	1953–54	1,000 bales	67	78	702	847
Short (upland)	1953	do	32.5	1953–54	do	16,370	3,698	15,855	35,923
Silk:									
Green cocoons	1952	1,000 pounds	12	1952	1,000 pounds	(1)	1,000	381,100	382,100
Raw silk	1952	do	7,600	1952	do	(2)	100	46,700	46,800
Wool	1953	1,000,000 pounds	573.0	1953	Million pounds; grease basis	271	769	3,376	4,416

[1] Negative.

Sources: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division, Sugar and Tropical Products Branch; U. S. Department of Agriculture, FAS, Livestock and Wool Division, Commodity Analysis Branch; U. S. Department of Agriculture, FAS, Cotton Division, Commodity Analysis Branch.

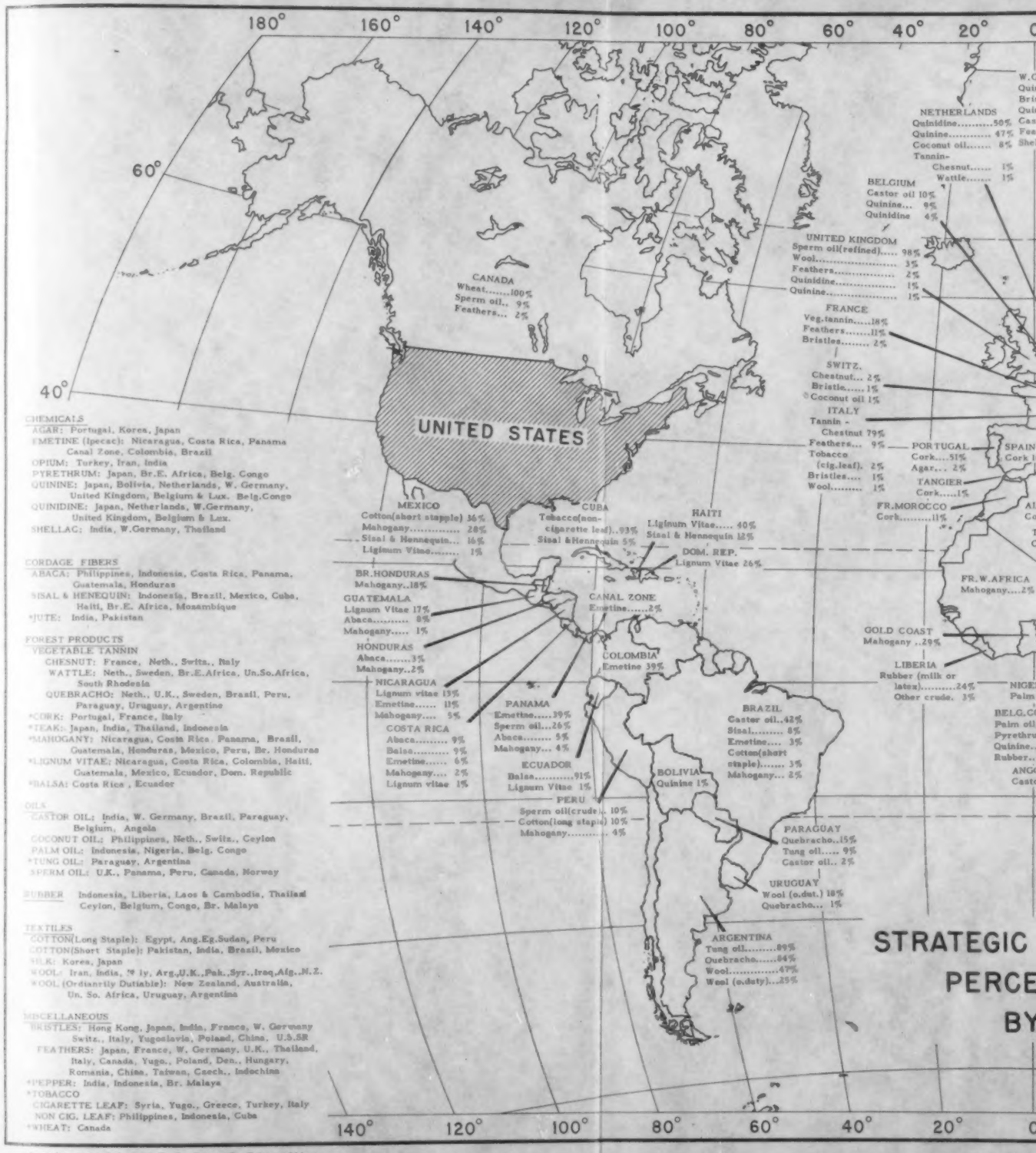
TABLE 6.—*Strategic raw materials—Current situation, miscellaneous products*

Commodity	United States imports			World production					
	Calendar year	Unit	Quantity	Crop year	Unit	United States	Other Western Hemisphere	Other world	World total
Bristles, hog	1952	1,000,000 pounds	5.4	(1)	1,000,000 pounds	(2)	(2)	(3 7–10)	(3 7–10)
Feathers and down	1952	do	11.0	1953	do	(25)	(2)	(45–50)	(70–75)
Wheat	1953	1,000,000 bushels	5.3	1953	1,000,000 bushels	1,168.5	963.5	5,018.0	7,150.0
Pepper	1953	1,000,000 pounds	30.5	1952	1,000,000 pounds	0	1.4	76.0	77.6
Tobacco, leaf	1953	do	93.7	1953	do	2,080.7	896.3	4,346.9	7,323.9

[1] Approximate annual.
[2] Negative.
[3] China produces about 90 percent of the world total.

Sources: U. S. Department of Agriculture, FAS, Tobacco and Tropical Products Division; U. S. Department of Agriculture, FAS, Livestock and Wool Division, Commodity Analysis Branch; U. S. Department of Agriculture, FAS, Grain Division, Commodity Analysis Branch.

NON-MINERAL SUPPLIES-1952
Bristles — China, W. Germany, India
Castor Oil — Brazil, India
Coconut Oil — Philippine Islands
Cotton (Long Staple) — Peru, Egypt
Feathers — China, France, Italy, W. Germany
Ipecac — Colombia, Panama, Nicaragua
Manila & Abaca — Philippine Islands, Guatemala, Panama, Honduras
Opium — Iran, Turkey, India
Palm Oil — Philippine Islands
Pepper — India, Indonesia
Pyrethrum — Belgian Congo, British East Africa
Quebracho — Argentina
Quinine — Netherlands, W. Germany
Rubber — British Malaya, Indonesia, Thailand
Shellac — India, Thailand
Silk — Japan
Sisal & Henequin — British East Africa, Haiti, Brazil, Mexico
Sperm Oil — Norway, Panama, Portugal
Wool — United States, Australia, Argentina, New Zealand, Union South Africa, Uruguay
CHINA Bristles 63% Feathers 30%
INDONESIA Pepper 29% Palm Oil 27% Rubber 30%
THAILAND Rubber 13% Shellac 25%
JAPAN Silk 89%
PHILIPPINE ISLANDS Manila & Abaca 09% Coconut Oil 160%
MALAYA Rubber 30%
AUSTRALIA Wool 17%
NEW ZEALAND Wool 19%
UNITED STATES Wool 27%
MEXICO Sisal & Henequin 14%
GUATEMALA Manila & Abaca 05
NICARAGUA Ipecac 11%
HAITI Sisal & Henequin 13%
PANAMA Manila & Abaca 06 Ipecac 30% Sperm Oil 37%
COLOMBIA Ipecac 11%
PERU Cotton 89%
BRAZIL Sisal & Henequin 10% Castor Oil 42%
URAGUAY Wool 56
ARGENTINA Quebracho 80% Wool 14%
NORWAY Sperm Oil 37%
NETHERLANDS Quinine 75%
WEST GERMANY Quinine 10% Bristles 12% Feathers 3%
FRANCE Feathers 11%
ITALY Feathers 9%
TURKEY Opium 20%
IRAN Opium 45%
INDIA Pepper 09% Shellac 74% Opium 03% Castor Oil 25% Bristles 3%
EGYPT Cotton 11%
BELGIAN CONGO Pyretrum 53% Palm Oil 72%
BRITISH EAST AFRICA Sisal & Henequin 40% Pyretrum 47%
UNION OF SOUTH AFRICA Wool 5%
Mineral, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate
Prepared from data supplied by United States Departments of Commerce and Agriculture



CHEMICALS
AGAR: Portugal, Korea, Japan
EMETINE (Ipecac): Nicaragua, Costa Rica, Panama Canal Zone, Colombia, Brazil
OPIUM: Turkey, Iran, India
PYRETHRUM: Japan, Br.E. Africa, Belg. Congo
QUININE: Japan, Bolivia, Netherlands, W. Germany, United Kingdom, Belgium & Lux. Belg.Congo
QUINIDINE: Japan, Netherlands, W.Germany, United Kingdom, Belgium & Lux.
SHELLAC: India, W.Germany, Thailand

CORDAGE FIBERS
ABACA: Philippines, Indonesia, Costa Rica, Panama, Guatemala, Honduras
SISAL & HENEQUIN: Indonesia, Brazil, Mexico, Cuba, Haiti, Br.E. Africa, Mosambique
*JUTE: India, Pakistan

FOREST PRODUCTS
VEGETABLE TANNIN
CHESNUT: France, Neth., Switz., Italy
WATTLE: Neth., Sweden, Br.E.Africa, Un.So.Africa, South Rhodesia
QUEBRACHO: Neth., U.K., Sweden, Brazil, Peru, Paraguay, Uruguay, Argentine
*CORK: Portugal, France, Italy
*TEAK: Japan, India, Thailand, Indonesia
*MAHOGANY: Nicaragua, Costa Rica, Panama, Brazil, Guatemala, Honduras, Mexico, Peru, Br. Honduras
*LIGNUM VITAE: Nicaragua, Costa Rica, Colombia, Haiti, Guatemala, Mexico, Ecuador, Dom. Republic
*BALSA: Costa Rica , Ecuador

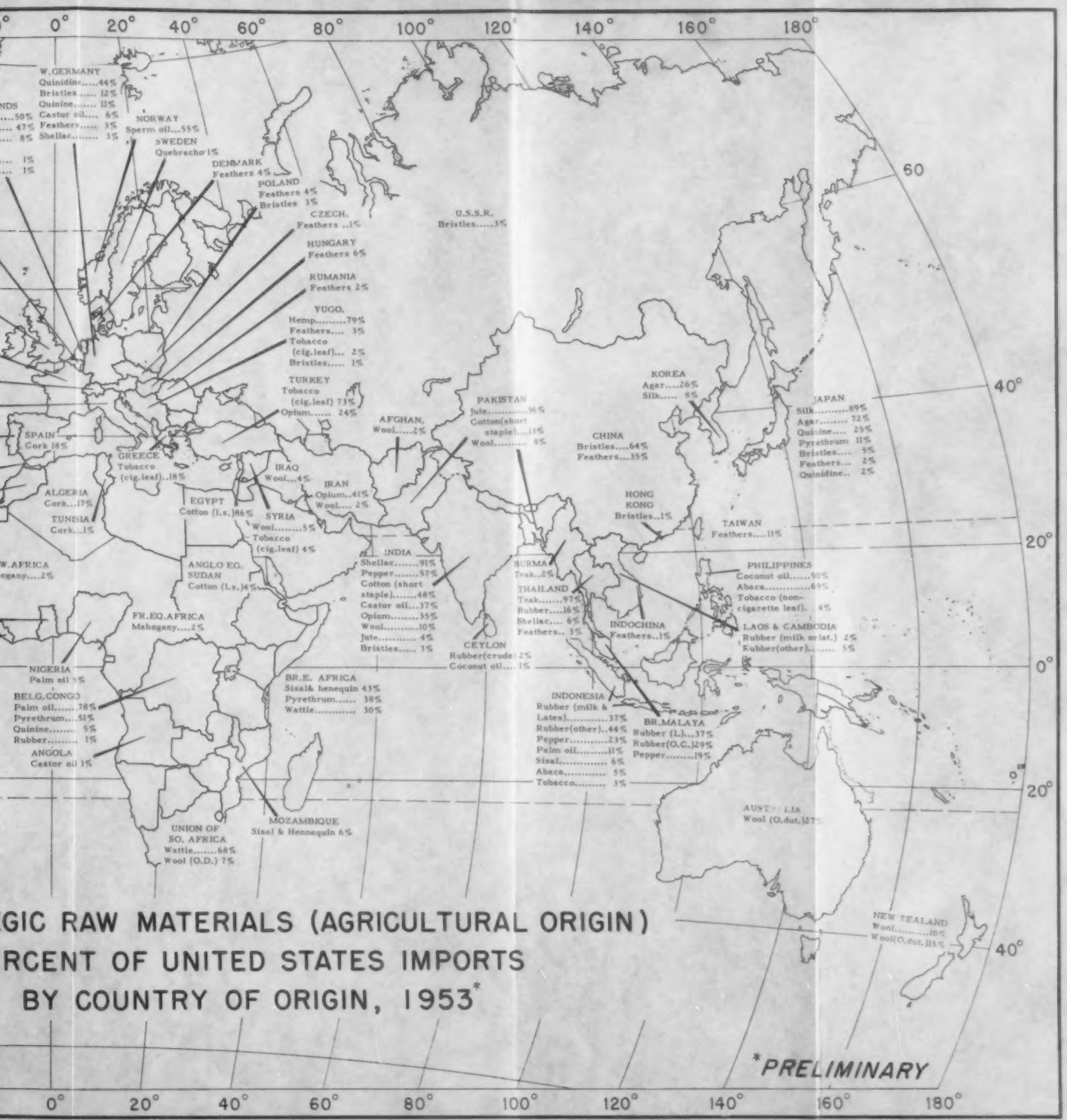
OILS
*CASTOR OIL: India, W. Germany, Brazil, Paraguay, Belgium, Angola
COCONUT OIL: Philippines, Neth., Switz., Ceylon
PALM OIL: Indonesia, Nigeria, Belg. Congo
*TUNG OIL: Paraguay, Argentina
*SPERM OIL: U.K., Panama, Peru, Canada, Norway

RUBBER Indonesia, Liberia, Laos & Cambodia, Thailand Ceylon, Belgium, Congo, Br. Malaya

TEXTILES
COTTON(Long Staple): Egypt, Ang.Eg.Sudan, Peru
COTTON(Short Staple): Pakistan, India, Brazil, Mexico
SILK: Korea, Japan
WOOL: Iran, India, Italy, Arg.,U.K.,Pak.,Syr.,Iraq,Afg.,N.Z.
WOOL (Ordinarily Dutiable): New Zealand, Australia, Un. So. Africa, Uruguay, Argentina

MISCELLANEOUS
BRISTLES: Hong Kong, Japan, India, France, W. Germany Switz., Italy, Yugoslavia, Poland, China, U.S.SR
FEATHERS: Japan, France, W. Germany, U.K., Thailand, Italy, Canada, Yugo., Poland, Den., Hungary, Romania, China, Taiwan, Czech., Indochina
*PEPPER: India, Indonesia, Br. Malaya
*TOBACCO
CIGARETTE LEAF: Syria, Yugo., Greece, Turkey, Italy
NON CIG. LEAF: Philippines, Indonesia, Cuba
*WHEAT: Canada

Minerals, Materials and Fuels Economic Subcommittee
Interior and Insular Affairs Committee, United States Senate



GIC RAW MATERIALS (AGRICULTURAL ORIGIN)
RCENT OF UNITED STATES IMPORTS
BY COUNTRY OF ORIGIN, 1953*

*PRELIMINARY

Prepared from data supplied by United States Department of Agriculture

48427 O - 54 (Face p. 146) No. 1

MATERIAL	UNITED STATES							
	STRATEGIC RAW MATERIALS (Agricultural or Animal Origin)					SUBSTITUTES (Material and/or Sub		
	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE ON FOREIGN SOURCES AND GOOD POSSIBILITY FOR IMPROVEMENT	D PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH GOOD POSSIBILITY FOR IMPROVEMENT	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE O FOREIGN SOURC AND GOOD POSSIBILITY F IMPROVEMENT
Chemicals:								
Agar					Agar			
Emetine		Emetine						
Hyoscine			Hyoscine					
Opium			Opium					
Pyrethrum			Pyrethrum					
Quinine		Quinine				Quinine		
Quinidine		Quinidine					Quinidine	
Shellac			Shellac			Shellac		
Cordage Fibers:								
Abaca		Abaca						Abaca
Sisal		Sisal						Sisal
Henequen			Henequen					Henequen
Jute		Jute						Jute
Forest Products:								
Tannins (Chestnut (Quebracho (Wattle					Tannin Products			Tannin Produc
Cork		Cork				Cork		
Teak		Teak				Teak		
Mahogany		Mahogany				Mahogany		
Lignum Vitae		Lignum Vitae				Lignum Vitae		
Balsa		Balsa				Balsa		
Oils:								
Castor					Castor			
Coconut		Coconut						Coconut
Palm		Palm						
Sperm			Sperm					Sperm
Tung	Tung					Tung		
Rubber:			Rubber					
Textiles:								
Cotton, Extra Long Staple					Cotton, Extra Long Staple	Cotton, Extra Long Staple		
Cotton, Upland	Cotton, Upland					Cotton, Upland		
Silk		Silk						
Wool			Wool					Wool
Miscellaneous:								
Bristles, Hog			Bristles, Hog					Bristles,
Feathers & Down, Waterfowl		Feathers & Down, Waterfowl						Feathers & Do Waterfowl
Pepper		Pepper					Pepper	
Wheat	Wheat					Wheat		
Tobacco	Tobacco					Tobacco		

ative self-sufficiency (based on actual position of each material shown and a combination of the material and/or substitute or potential substitute therefor. Possibility for improvement in degree of self-s
implied in column headings below, would be contingent upon research, expanded production, capital funds, or by other means)

WESTERN HEMISPHERE

STRATEGIC RAW MATERIALS
(Agricultural or Animal Origin)

STITUTES nd/or Substitutes) C ENDENCE ON GN SOURCES D GOOD BILITY FOR ROVEMENT	D PARTIAL DEPEND-ENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPEND-ENCE ON FOREIGN SOURCES WITH GOOD POSSIBILITY FOR IMPROVEMENT	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE ON FOREIGN SOURCES AND GOOD POSSIBILITY FOR IMPROVEMENT	D PARTIAL DEPEND-ENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPEND-ENCE ON FOREIGN SOURCES WITH GOOD POSSIBILITY FOR IMPROVEMENT	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	DEPEND FOREIGN AND R POSSIBI IMPRO
		Agar	Emetine	Hyoscine			Agar		
		Emetine			Opium				
		Pyrethrum			Pyrethrum				
						Quinine			
					Quinidine				
					Shellac				
Abaca							Abaca		
Sisal							Sisal		
Henequen			Henequen						
Jute				Jute					
n Products						Tannin Products			
				Cork					
				Teak					
			Mahogany						
			Lignum Vitae						
			Balsa						
		Castor					Castor		
Coconut					Coconut				
		Palm					Palm		
Spars			Sperm						
			Tung					Tung	
		Rubber			Rubber				
							Cotton, Extra Long Staple	Cotton, Extra Long Staple	
			Cotton, Upland					Cotton, Upland	
		Silk			Silk				
Wool							Wool		
Bristles, Hog					Bristles, Hog				
thers & Down, aterfowl				Feathers & Down, Waterfowl					
					Pepper				
			Wheat					Wheat	

Current non-mineral position—relative self-sufficiency (based on actual position of each material shown and a combination of the material and/or substitute or potential substitute therefor. Possibili
implied in column headings below, would be contingent upon research, expanded production, capital funds, or by other means)

WESTER

SUBSTITUTES (Material and/or Substitutes)					STRATEGIC RAW MATERIALS (Agricultural or Animal Origin)				
A L SELF- CIENCY URED NITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE ON FOREIGN SOURCES AND GOOD POSSIBILITY FOR IMPROVEMENT	D PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH GOOD POSSIBILITY FOR IMPROVEMENT	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE ON FOREIGN SOURCES AND GOOD POSSIBILITY FOR IMPROVEMENT	D PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPE ENCE ON FORE SOURCES WIT GOOD POSSIBIL FOR IMPROVEM
				Agar	Emetine				Agar
				Emetine		Hyoscine			
							Opium		
				Pyrethrum			Pyrethrum		
inine								Quinine	
	Quinidine						Quinidine		
ellac							Shellac		
									Abaca
		Abaca							
		Sisal							Sisal
		Henequen			Henequen				
		Jute				Jute			
		Tannin Products						Tannin Products	
rk						Cork			
ak						Teak			
hogany					Mahogany				
gnum Vitae					Lignum Vitae				
lsa					Balsa				
				Castor					Castor
		Coconut					Coconut		
				Palm					Palm
		Spars			Spars				
g					Tung				
				Rubber			Rubber		
									Cotton, E Long St
ton, Extra ng Staple					Cotton, Upland				
ton, Upland				Silk			Silk		
		Wool							Wool
		Bristles, Hog					Bristles, Hog		
		Feathers & Down, Waterfowl				Feathers & Down, Waterfowl			
	Pepper						Pepper		
					Wheat				
oc									

ossibility for improvement in degree of self-sufficiency

WESTERN HEMISPHERE								
	SUBSTITUTES (Material and/or Substitutes)							
E L DEPEND- N FOREIGN ES WITH SSIBILITY PROVEMENT	A VIRTUAL SELF-SUFFICIENCY ASSURED INDEFINITELY	B DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	C DEPENDENCE ON FOREIGN SOURCES AND REMOTE POSSIBILITY FOR IMPROVEMENT	D PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH LITTLE HOPE FOR IMPROVEMENT	E PARTIAL DEPENDENCE ON FOREIGN SOURCES WITH GOOD POSSIBILITY FOR IMPROVEMENT	F ACTION REQUIRED IN U.S. OR W.H. TO IMPROVE AVAILABILITY OF MATERIAL OR SUBSTITUTE IN OR TO THE U.S.	G SUBSTITUTE OR POTENTIAL SUBSTITUTE MATERIALS	MATERIALS
								Chemicals:
					Agar	Exploration & Recovery Funds	No substitutes	Agar
						Further Research	Diodoquin, Chloroquin, Aureomycin, Terramycin	Emetine
						Research, price guarantee	No substitutes	Hyoscine
						Reasons re Geneva conference, extraction plants	No substitutes	Opium
						Obtaining seed, price guarantee, plant research, harvesting machinery	Partial: Allethrin	Pyrethrum
						Price guarantees for W. H. production	Atabrine, Chloroquin, Palubrine	Quinine
						Price guarantees to W. H.	No substitutes	Quinidine
						--	Synthetic resins from petroleum & agri. sources	Shellac
								Cordage Fibers:
e					Abaca	Production research, price guarantees, also same for substitutes	Sansevieria, Phormium, Sisal	Abaca
l					Sisal	Price guarantees	Sansevieria, Henequen, Ad. Hemp, Phormium	Sisal
			Henequen			Price guarantees	Kenaf, Cotton & Paper are poor substitutes	Henequen
			Jute			Price guarantees helpful; but more research & price guarantee for Kenaf	Kenaf, Cotton	Jute
								Forest Products:
				Tannin Products		Further research and production program	Cannigre, Oak, Douglas Fir, Hemlock	Tannins (Chestnut (Quebracho (Wattle
					Cork	Price guarantees, some research	Fiber glass, Asbestos, Plastics, Rubber, Certain Wood Barks, Hair Felt	Cork
					Teak	Further research on substitutes	Other Timber species, possibly plastics	Teak
						Higher price, further develop logging operations in W. H.	Other Timber species	Mahogany
						Higher price, develop logging operations in W.H.	Plastics, metal, phenolic resins	Lignum Vitae
						Increased logging through price guarantee in W.H.	Glass wool, cellulose acetate, rubber foam	Balsa
								Oils:
tor					Castor	Further research, price guarantees, expanded production	Tung, modified linseed, soybean, oiticica Potentials: Products from turpentine and animal fats	Castor
			Coconut			Research and price guarantees in W. H.	Inedible animal fats, synthetic detergents In W. H.: babassu oil cohune	Coconut
a					Palm	Research and price guarantees in W. H.	Inedible tallow (lard and grease)	Palm
					Sperm	Price guarantees and cost of whaling expeditions	Wild shrub "Simmondsia" in U.S. and W.H.	Sperm
	Tung					--	Linseed, castor, soybean, fish oils, alkyd resins, later compounds. In W.H. linseed, soybean, oiticica	Tung
					Rubber	Research on both natural and synthetic	Synthetics	Rubber:
								Textiles:
ton, Extra ong Staple	Cotton, Extra Long Staple					Expanded production	Nylon, rayon	Cotton, Extra Long Staple
	Cotton, Upland					--	Not required	Cotton, Upland
			Silk			Price guarantees. Further research	Acetylated cotton, nylon, rayon acetate	Silk
l					Wool	--	Man-made fibers, re-processed and re-used wool	Wool
								Miscellaneous:
			Bristles, Hog			Research on substitute materials	Nylon, horsehair, Kmatin (Exper.)	Bristles, Hog
			Feathers & Down, Waterfowl			Develop mechanical sorters, research on substitutes	Curled chicken feathers, synthetic fibers of acrylic type	Feathers & Down, Waterfowl
			Pepper			Research, capital & price guarantees in W. H.	--	Pepper
	Wheat					--	--	Wheat
	[redacted]					--	--	Tobacco

PREPARED BY COMMODITY STABILIZATION SERVICE IN COOPERATION WITH AGRICULTURAL RESEARCH SERVICE, FOREIGN AGRICULTURAL SERVICE, AND FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.
MARCH 1954

SELECTED NAMES OF COMPANIES PRODUCING COPPER, LEAD, AND ZINC

American Smelting & Refining Co., 120 Broadway, New York City.
American Zinc, Lead & Smelting Co., Paul Brown Building, 818 Olive Street, St. Louis, Mo.
Anaconda Copper Mining Co., 25 Broadway, New York, City.
Combined Metals Reduction Co., 218 Felt Building, Salt Lake City, Utah.
Eagle-Picher Co., American Building, 28 East Central Parkway, Cincinnati, Ohio.
Federal Mining & Smelting Co., 120 Broadway, New York City.
Kennecott Copper Corp., 161 East 42d Street, New York City.
National Lead Co., 111 Broadway, New York City.
New Jersey Zinc Co., 160 Front Street, New York City.
Phelps Dodge Corp., 40 Wall Street, New York City.
St. Joseph Lead Co., 250 Park Avenue, New York City.

TITANIUM PRODUCERS

Crane Co., Chicago, Ill.
Dow Chemical Co., Midland, Mich.
E. I. duPont de Nemours & Co., Wilmington, Del.
Monsanto Chemical Co., St. Louis, Mo.
Titanium Metals Corporation of America, Henderson, Nev.

Per capita consumption of metal commodities

	Per capita consumption (pounds)						
	1900	1910	1920	1930	1940	1950	1953 [1]
Population, millions	76.0	92.0	105.7	122.8	131.7	150.7	161.1
COMMODITY							
Iron ore	836	1,427	1,425	1,100	1,270	1,537	1,767
Primary aluminum	0.07	0.38	1.58	1.15	3.44	11.88	19.31
Primary copper	4.68	7.92	9.90	10.28	15.30	19.14	17.99
Primary lead [2]	[3]	9.16	10.81	9.14	10.29	13.38	10.60
Primary zinc [2]	[3]	6.42	8.38	8.44	11.84	15.92	14.51

[1] Estimated.
[2] Includes lead and zinc compounds.
[3] Not available.

ELEMENTS

Because of the extreme importance of the strategic and critical mineral situation and the common use of the oxide formulas for such common ores as chromium (Cr_2O_3), manganese (MnO_2), and tungsten (WO_3), it is necessary, for a general understanding of the terms to have a reference table available.

Elements as of 1953

Atomic No.	Name	Symbol	O=16 Atomic weight	Atomic No.	Name	Symbol	O=16 Atomic weight
89	Actinium	Ac	227.	43	Masurium	Ma	97.80
85	Astaline	At	210.0	80	Mercury	Hg	200.61
13	Aluminum	Al	26.97	42	Molybdenum	Mo	95.95
95	American	Am	241.0	60	Neodymium	Nd	144.27
51	Antimony (Stibium)	Sb	121.76	10	Neon	Ne	20.183
18	Argon	A	39.994	93	Neptanium	Np	237.0
33	Arsenic	As	74.91	28	Nickel	Ni	58.69
56	Barium	Ba	137.36	7	Nitrogen	N	14.008
97	Berkelium	Bk	244.0	76	Osmium	Os	190.20
4	Beryllium	Be	9.02	8	Oxygen	O	16.0
83	Bismuth	Bi	209.00	46	Palladium	Pd	106.7
5	Boron	B	10.82	15	Phosphorus	P	30.98
35	Bromine	Br	79.916	78	Platinum	Pt	195.23
48	Cadmium	Cd	112.41	94	Plutonium	Pu	239.0
55	Cesium	Cs	132.91	84	Polonium	Po	210.0
20	Calcium	Ca	40.08	19	Potassium	K	39.096
6	Carbon	C	12.01	59	Praseodymium	Pr	140.92
58	Cerium	Ce	140.13	91	Protoactinium	Pa	231.0
17	Chlorine	Cl	35.457	88	Radium	Ra	226.05
24	Chromium	Cr	52.01	86	Radon	Rn	222.0
27	Cobalt	Co	58.94	75	Rhenium	Re	186.31
41	Columbium	Cb	92.91	45	Rhodium	Rh	102.91
29	Copper	Cu	63.57	37	Rubidium	Rb	85.48
96	Curium	Cm	242.0	44	Ruthenium	Ru	101.70
66	Dysprosium	Dy	162.46	62	Samarium	Sa	150.43
68	Erbium	Er	167.2	21	Scandium	Sc	45.1
63	Europium	Eu	152.0	34	Selenium	Se	78.96
9	Fluorine	F	19.0	14	Silicon	Si	28.06
64	Gadolinium	Gd	156.9	47	Silver (Argentum)	Ag	107.880
31	Gallium	Ga	69.72	11	Sodium (Natrium)	Na	22.997
32	Germanium	Ge	72.6	38	Strontium	Sr	87.63
79	Gold (Aurum)	Au	197.2	16	Sulphur	S	32.064
72	Hafnium	Hf	178.6	73	Tantalum	Ta	180.88
2	Helium	He	4.003	52	Tellurium	Te	127.61
67	Holmium	Ho	164.94	65	Terbium	Tb	159.2
1	Hydrogen	H	1.008	81	Thallium	Tl	204.39
61	Illinium	Il	146.00	90	Thorium	Th	232.12
49	Indium	In	114.76	69	Thulium	Tm	169.40
53	Iodine	I	126.92	50	Tin (Stannum)	Sn	118.70
77	Iridium	Ir	193.1	22	Titanium	Ti	47.90
26	Iron (Ferrum)	Fe	55.85	74	Tungsten	W	183.92
36	Krypton	Kr	83.7	92	Uranium	U	238.07
57	Lanthanum	La	138.92	23	Vanadium	V	50.95
82	Lead (Ordinary)	Pb	207.21	87	Virginium	Vi	223.0
82	Lead (Uranium)	Pb	206.0	54	Xenon	Xe	131.30
3	Lithium	Li	6.94	70	Ytterbium	Yb	173.04
71	Lutecium	Lu	174.99	39	Yttrium	Yt	88.92
12	Magnesium	Mg	24.32	30	Zinc	Zn	65.38
25	Manganese	Mn	54.93	40	Zirconium	Zr	91.22

Americum, Berkelium, Curium, Neptunium, and Plutonium have been added to the list since 1942.

Metal content of minerals

Element	Mineral or compound	Percentage of element present
Aluminum	Alumina, Al_2O_3	52.91
	Aluminum oxide, Al_2O_3	52.91
	Alunite ($K_2O.3Al_2O_3.4SO_3.6H_2O$)	19.54
	Bauxite ($Al_2O_3.2H_2O$)	31.85
Antimony	Antimony trioxide, Sb_2O_3	83.53
	Stibnite (Sb_2S_3)	71.70
Beryllium	Beryllia, BeO	36.05
	Glucina, BeO	36.05
	Beryllium oxide, BeO or Be_2O_2	36.05
Bismuth	Bismuth trioxide, Bi_2O_3	86.70
	Bismuth dioxide, BiO_2	86.72
Chromium	Chromium oxide, Cr_2O_3	68.42
	Chromium sesquioxide, Cr_2O_3	68.42
	Chromic anhydride, CrO_3	52.00
	Chromite ($FeOCr_2O_3$)	46.46
Cobalt	Cobaltous oxide, CoO	78.64
	Cobaltous-ic oxide, Co_3O_4	73.42
	Cobaltic oxide, Co_2O_3	71.06
Columbium (Niobium).	Columbium pentoxide, Cb_2O_5	69.90
	Niobium pentoxide, Nb_2O_5	69.90
Copper	Copper oxide	
	Cuprous oxide, Cu_2O	88.82
	Cupric oxide, CuO	79.89
	Cupric oxide, Cu_2O_2	79.89
	(Chalcopyrite ($CuFeS_2$))	34.50
	(Chalocelte (Cu_2S))	79.80
	(Bornite (Cu_5FeS_4))	63.50
	Malachite ($CuCO_3.Cu(OH)_2$))	63.90
	Gadolinia, Gd_2O_3	86.73
	Gadolinium oxide, Gd_2O_3	86.73
Gallium	Gallium sesquioxide, Ga_2O_3	75.60
Germanium	Germania, GeO_2	69.40
	Germanium oxide, GeO_2	69.40
Cadmium	Cadmia, CdO	87.54
	Cadmium oxide, Cd_2O_2	87.54
	Greenockite (CdS)	77.80
Cerium	Ceria, CeO_2	81.40
	Ceric oxide, CeO_2	81.40
	Cerous oxide, Ce_2O_3	85.37
Cesium (Caesium).	Cesium oxide, Cs_2O_4	80.60
	Cesium oxide, Cs_2O	94.32
Hafnium	Hafnia, HfO_2	84.81
	Hafnium oxide, HfO_2	84.81
Iron	Ferrous oxide, FeO	77.73
	Ferrosoferric oxide, Fe_3O_4	72.356
	Ferric oxide, Fe_2O_3	69.94
	Iron sesquioxide, Fe_2O_3	69.94
	Iron protoxide, FeO	77.73
	Pyrites (FeS_2)	46.60
Lead	Lead monoxide, PbO	92.8318
	(Galena (PbS))	86.60
	(Cerussite ($PbCO_3$))	77.60
Lithium	Lithia, Li_2O	46.452
	Lithium oxide, Li_2O	46.452
Magnesium	Magnesia, MgO	60.317
	Magnesium oxide, MgO	60.317
	(Magnesite ($MgCO_3$))	28.84
	Dolomite ($MgCa(CO_3)_2$)	13.14
	Magnesium chloride ($MgCl_2.6H_2O$)	12.02
	(Kieserite ($MgSO_4H_2O$))	17.60
	(Epsomite ($MgSO_4.7H_2O$))	9.88
Manganese	Manganous oxide, MnO	77.442
	Manganese sesquioxide, Mn_2O_3	69.593
	Manganese dioxide, MnO_2	63.19
	(Pyrolusite (MnO_2))	63.19
	(Rhodochrosite ($MnCO_3$))	47.80
Mercury	Mercurous oxide, Hg_2O	96.165
	Mercuric oxide, HgO	92.61
	Cinnabar (HgS)	86.2
Molybdenum	Molybdic anhydride, MoO_3	66.655
	Molybdic trioxide, MoO_3	66.655
	(Molybdenite (MoS_2))	60.0
	(Wulfenite ($PbMoO_4$))	26.2
Neodymium	Neodymia, Nd_2O_3	85.737
	Neodymium oxide, Nd_2O_3	85.737

Metal content of minerals—Continued

Element	Mineral or compound	Percentage of element present
Nickel	Nickel sesquioxide, Ni_2O_3	70.976
	Pentlandite (FeNiS)	40.46
	Niccolite (NiAs)	43.93
Niobium. *See* Columbium.		
Selenium	Selenium dioxide, SeO_2	71.160
Sodium		
Strontium	Strontia, SrO	84.560
	Strontium oxide, SrO	84.560
Tantalum	Tantalum pentoxide, Ta_2O_5	81.890
Thallium	Thallous oxide, Tl_2O	95.23
	Thallic oxide, Tl_2O_3	89.49
Thorium	Thoria, ThO_2	87.884
	Thorium dioxide, ThO_2	87.884
Tin	Tin dioxide, SnO_2 (Cassiterite)	78.765
	Stannic oxide, SnO_2	78.765
Titanium	Titania, TiO_2 (Rutile)	59.95
	Titanium dioxide, TiO_2	59.95
	Ilmenite ($FeTiO_3$)	31.57
Tungsten	Tungsten trioxide, WO_3	79.303
	(Scheelite ($CaWO_4$))	63.90
	(Wolframite ($FeMnWO_4$))	51.38
Uranium	Uranium oxide, U_3O_8	84.801
	Uranium trioxide, UO_3	83.22
	Uranyl oxide, UO_3	83.22
	Carnotite ($K_2O.2UO_3.2V_2O_5.2H_2O$)	11.48
Vanadium	Vanadium pentoxide, V_2O_5	56.019
	Vanadinite ($PbCl.Pb(VO_4)_2$)	10.86
Ytterbium	Yttria, Y_2O_3	87.819
	Ytterbium oxide, Yb_2O_3	87.819
Yttrium	Yttria, Y_2O_3	78.746
	Yttrium oxide, Y_2O_3	78.746
Zinc	Zinc oxide, ZnO	80.339
	Zinc sulfide, ZnS	67.00
Zirconium	Zirconia, ZrO_2	74.030
	Zirconium oxide, ZrO_2	74.030

SELECTED LIST OF COMMERCIAL METALS AND MINERALS

Aluminum
Antimony
Asbestos
Arsenic
Barite
Bauxite
Beryllium
Bismuth
Boron minerals
Bromine
Cadmium
Celestite (strontion minerals)
Cesium-Rubidium
Coal
Cobalt
Columbium-Tantalum
Copper
Corundum
Diamond (industrial)
Feldspar
Fluorspar
Gallium
Gas (natural)
Germanium
Gold
Graphite
Helium
Indium
Iron ore
Iodine
Kyanite
Lead
Lithium
Magnesium
Manganese
Mercury
Mica
Molybdenum
Monazite
Nickel
Nitrates
Petroleum
Phosphate rock
Platinum
Potash
Quartz crystal (radio grade)
Rare earth metals
Salt (sodium chloride)
Selenium
Silver
Steatite talc (grinding and block)
Strontium minerals (celestite)
Sulfur
Tellurium
Thallium
Thorium
Tin
Titanium
Tungsten
Uranium
Vanadium
Zinc
Zirconium

PERCENTAGE DISTRIBUTION, BY COUNTRIES AND GEOGRAPHIC AREAS, OF WORLD PRODUCTION

OF SELECTED CRITICAL METALS AND MINERALS IN 1952

	Aluminum	Antimony	Asbestos	Bauxite	Beryllium	Bismuth	Cadmium	Chromite	Cobalt	Columbium	Copper, mine	Copper, smelter	Corundum	Diamonds, Industrial	Fluorspar	Graphite	Iron ore	Lead, mine	Lead, smelter	Magnesium metal	Manganese	Mercury	Mica, including scrap	Molybdenum	Nickel	Petroleum, crude	Platinum-group metals	Potash K_2O equiv.	Sulfur	Talc, Pyrophyllite and Soapstone	Tantalite	Tin, mine	Tin, smelter	Titanium: Ilmenite	Titanium: Rutile	Tungsten	Vanadium	Zinc, mine	Zinc, smelter
North America:																																						
Canada	22.1	2.5	99.2	13.2	7.1	[k] 4.5	7.3	0.6	5.9	[b] 0.2	3.6	6.3			[h] 6.4	1.0	1.6	5.2	9.1	[s] 3.1	1.4	[k] 4.4	0.5	0.6	71.4	1.4	39.9	27.5	[e] 2	1.6	[b]	0.1	0.1	[k] 4.3	[e]	1.7	[k] N.E.	13.2	[k] 3.8
United States	31.5	4.3	1.4			[e]	61.9				30.7	32.8			[h] 26.4	2.7	33.5	19.4	21.9	[s] 63.6			57.1	[e] 1.4		50.9	4.3		[e] 2	17.0		0.1	13.4	51.7	[e]	[k] 12.5	[e]	[k] 24.0	[k] 17.1
Total	53.6	6.8	99.6	13.2	7.1	4.5	69.2	0.6	5.9	0.2	34.3	39.1			31.8	3.7	35.1	27.5	31.2	66.9	1.4	4.4	57.6	80.0	71.7	52.3	43.9	27.5	[e] 2	18.5	[b]	0.2	13.5	56.0	[e]	[k] 12.5	[e]	37.2	[k] 20.9
Middle America:																																						
Central America:																																						
El Salvador																		[s] 0.2																				
Guatemala								[e]																													[k] 0.3	
Honduras																						[e]																
Mexico		12.0				16.9			0.1		2.1	1.8			15.1	12.7	0.2	13.5	13.2		1.3	5.8	[e]			[a] 1.7			0.2			0.2	0.1			0.8		9.0	3.4
West Indies:																																						
Cuba								1.9			0.7						[e]	[e]			[a] 3.3				4.7	[e]													
Jamaica				[e] 2.7																																			
Trinidad																										0.5												
Total		12.0		2.7		16.9		1.9	0.1		2.8	1.8			15.1	12.7	0.2	13.7	13.2		4.6	5.8	[e]		4.7	2.0			0.2			0.2	0.1			0.8		9.1	3.4
South America:																																						
Argentina		[e]	[e]		[a] 7.6	[e]		[e]		[e]			[e]		[e]	[e]	[e]	1.0	1.1		[e]	[e]	1.2			0.6			[e] 0.1	[e] 1.1		[a] 0.1	[e] 0.2			[e] 1.1	[e]	[e] 0.6	[a] 0.4
Bolivia		[d] 21.3	[e]			[e]					[a] 0.2				[e]	[e]	[e]	[d] 1.6	[e]									[d] 0.1		[d] 16.5	[d] 0.1			[d] 6.7		[d] 1.3	
Brazil	[a]		[e]	[e]	[d] 36.6	[e]		[e]		[a] 0.1			[e]	0.6	[e]	[e]	1.0	[e]	[e]		[a] [d] 2.1		[e]		[e]				[e]	[a] 2.4		[a] 0.1	[a] 0.1	[e]	[e]	[d] 3.2			
British Guiana				18.9										0.1																									
Chile			[e]		[e]						14.6	13.5					0.7	[a] 0.2			0.5	[e]		72.4		[e]		[e] 0.6	[e]									
Colombia																										0.9	4.4												
Ecuador																		[e]																				
Peru		1.1				17.8					1.1	0.7						[e] 4.4	2.7		[e]	[e]		[e]		0.1 [e] 0.4			0.1			[e]	[e]			1.1	[e] 0.0	4.6	0.2
Surinam				24.6																																		
Uruguay			[e]																				[e]					[e]											
Venezuela														0.2			8.7									[b] 1.7												
Total	[e]	22.4	[e]	43.5	45.2	17.8		[e]		0.1	18.1	14.2	[e]	0.9	[e]	[e]	2.4	8.9	4.8		0.5	[e]	1.2	7.4	[e]	18.7	4.9	[e]	[e] 0.9	1.1	49.4	18.7	0.4	[e]	[e]	12.1		5.3	3.5
TOTAL WESTERN HEMISPHERE	63.6	41.2	62.6	59.4	53.3	39.2	69.2	2.5	5.8	0.3	55.1	55.1	[e]	0.9	46.9	16.4	37.7	49.5	50.2	66.9	4.0	11.2	60.1	90.4	76.1	71.2	48.9	27.5	[e] 3	32.7	52.4	19.1	14.0	68.0	[e]	27.1		51.2	40.5
Europe:																																						
Albania								[e]																		[e]												
Austria	1.8	[e] 0.8		0.1							0.1	0.2			[e]	10.4	0.9	0.3	[f] 0.6 [f] 8.2			[e]	[e]	0.1		[e] 0.5										0.2		[f] 8.5
Belgium							[a] 9.5								[e]		[e]													3.4				6.2				
Bulgaria								[e]									[e]																				[e]	
Cyprus		[e]	[d] 1.3 [e]					[d] 0.4			[d] 1.0					[e]	[e] 0.7	[e]	[e]		[e]					[e]												
Czechoslovakia																																					[e]	[e]
Finland			[e] 0.4						[e]		[e] 0.8							[e]							[e]	0.2									[e] 0.1		[e] 0.3	
France	5.2	[e]	[e] 0.4	9.7	[e]	[e]	[a] 1.6				[e]	[e]			4.8		13.9	[e] 0.6	2.9	0.7						[e]		19.2	0.2	6.5		[e] 0.2	[a] 0.2			[a] 1.8		0.6	3.6
Germany, East	[e]					[e]					[e]	[e]					[e]		[e]									[e]										[e]	[e]
Germany, West	4.9			[e]		[e]	[a] 1.1				0.2	[f] 6.9			13.2	4.7	5.2	2.8	5.2							0.3		23.2		0.7			[e] 0.6				3.2	6.7
Greece	[e]	0.8	[e]	2.7				0.9			[e]						[e]	2.3	0.1		[a] 0.1									0.1							0.3	
Hungary	[e]	[e]		[e]							[e]						[a] 0.1	[e]	[e]		[e]					[a] 0.1												
Italy	2.6	1.7	1.7	2.2			2.1			[e]	[e]	[e]			4.9	2.1	0.3 2.4	2.2	1.9	0.6	0.5	37.2	[e]			[e] 0.1		[e]	3.9	5.4				16.3			[e]	4.5	2.4
Luxembourg																																						1.2
Netherlands																																						
Norway	2.5				[e]		[a] 1.8 [a] 3.8				0.5	0.8				2.2	0.3 [e] 3.3	[e] 1.1	1.1 [e]	0.9			0.4	0.5		[e]				[a] 1.1				13.2	0.1		0.2 3.4	1.7 4.3
Poland		[e]	[e]		1.2			[e]									[e]		[e]		0.1					[a]				[e]		[e] 0.6	[e] 0.2	[e]		[e] 6.8			
Portugal																																						
Rumania			[e]	[e]			[e]										[e] 0.2	[e]	[e]		[e]	[e]	[e]	[e]		[a] 0.7				[e]							[e]	[e]
Spain	0.2	1.4	[e]	[e]			[e] 0.1				0.4	0.2			6.2	0.3	1.0	[e] 4.4	2.6		[e] 4.4	[e] 2.1	[e]	[e]				3.1	0.1	1.9			0.3	0.4	0.1		[a] 3.3	1.0
Sweden	0.4						[e]				0.6	0.6			[e]	[e]	5.9	1.1	0.5		[e]		[e]	[e]						[e]							[a] 1.9	
Switzerland	1.4																[e]			0.2 [e] 3.2																		
U. S. S. R.	[a] 12.2		[e]	[e]			[e] [a] 2.5	[e]			[a] [d] 6.8	[a] [d] 4.4	[e]		[a] 6.5	[e]	[a] 16.6 5.5	[a] 8.5 0.2	[a] 5.6 [a] 0.2		[e] [a] 32.5	[e]	[e]	[e]	[a] 14.5	[a] 7.4 [e]	[a] 14.8	[e]	[e]	[e]		0.6	[a] 7.3		[a] 7.4 [e]	[a] 8.5 3.2
United Kingdom	1.4							[e]																														
Yugoslavia	0.1	5.9	0.2	4.5			5.5	[e] 1.4			1.2	1.2					0.2	4.1	3.7		0.2	9.7		[e]		[e]											1.9	0.7
Total	28.7	10.6	4.0	18.2	1.2	5.5	23.7	2.7	[e]		15.8	[e] 5.5	[e]		35.6	20.1	51.7	23.8	31.7	5.6	33.2	73.0	0.8	0.6	14.7	9.2	15.8	50.5	4.2	28.1		1.9	41.0	13.3	0.1	15.6		27.0	21.9
Africa:																																						
Algeria		2.9									[e]	[e]					1.0	0.2				[e]				[e]										[e] 0.1		[e] 0.5
Angola														1.9							[e] 0.7		0.2													[e]		[e]
Belgian Congo			[e]			[e]	[e] 0.3			[e] 6.3	6.8	7.5	7.3	[e] 20.9							[e] 1.0															[e] 0.2		3.9
Egypt																[e]										[e] 0.4			0.3									
Ethiopia																											[e]	[e]										
French Cameroons																																						
Fr. Eq. Africa										0.1			[e]	8.9				0.2																				
French Morocco		1.9	[e]		2.0					[e] 16.8	[e]			[e] 0.7	0.3	[e]	[e] 0.2	[e] 4.6	1.7		5.5		[e]		0.1	[e]										[e]		1.1
Fr. West Africa				0.9																																		
Gold Coast				[e] 0.6										11.8							[e] 10.3		[e]															
Kenya			[e]													[e]																							
Liberia																	[e] 0.3																					
Madagascar			[e]		[e] 5.0					0.2						[e] 9.7							[e] 0.9															
Mozambique				[e]	2.1					1.2													[e]															
Nigeria										[e] 5.2								[e]																				
Northern Rhodesia					0.1				[e] 5.9		12.0	11.2					[e]	0.7	0.7		0.1		[e]								2.4	[e] 4.5						
Nyasaland													0.5																						[k]	0.9		1.1
Senegal																																						
Sierra Leone								0.7						2.0													[e]								0.5	[e]			
Southern Rhodesia		0.2	5.4		18.5			10.1			[e]			[e] 0.7	0.4	0.6	[e] 0.5	[e]	2.9		[e] 0.3		0.6					10.9	[e]	[e]							[e] 0.8			
South-West Africa					[e] 8.2	[e]					0.5		37.9	[e] 0.7														[e] 4.0									[e] 0.2	[e]	0.6	
Spanish Morocco																	[e] 0.3	[e]			[e]																	
Swaziland			2.2																																			
Tanganyika					[e]						[e]			[e] 0.4				[e] 0.2					[e] 0.1															
Tunisia															[e] 0.2		[e] 0.3	[e] 1.3	[e] 1.4																		[e] 0.1	
Uganda					[e] 5.7	[a] 0.1				[e] 0.2								[e]					[e]															
Union of South Africa		15.7	8.5		[a] 0.1	[a] 0.1		16.1			1.3	1.2		3.7	0.3	0.2	0.6	[e]			11.4		0.2		0.6		[e] 0.1			0.6	7.4	[e] 0.5	0.5			[e] 0.6			
Total		20.6	16.1	1.5	[a] 0.1	0.2	0.3	26.9	[e] 5.9	31.7	21.3	17.7	38.4	97.0	1.6	10.5	3.2	10.1	1.3		32.0	[e]	1.0		0.9	0.4	15.1	[e]			0.3	36.1	11.0	2.3	0.0	0.5	0.7		7.1	1.3

	Aluminum	Antimony	Asbestos	Bauxite	Beryllium	Bismuth	Cadmium	Chromite	Cobalt	Columbium	Copper, mine	Copper, smelter	Corundum	Diamonds, Industrial	Fluorspar	Graphite	Iron ore	Lead, mine	Lead, smelter	Magnesium metal	Manganese	Mercury	Mica, including scrap	Molybdenum	Nickel	Petroleum, crude	Platinum-group metals	Potash, K_2O equiv.	Sulfur	Talc, Pyrophyllite and Soapstone	Tantalite	Tin, mine	Tin, smelter	Titanium: Ilmenite	Titanium: Rutile	Tungsten	Vanadium	Zinc, mine	Zinc, smelter
Asia:																																						
Afghanistan								•																													N. T.		
Bahrain Island																										0.2				0.1									
Burma		••									••							^e0.1	0.1							•						0.6				2.3			
Ceylon																1.1							•															
China		17.4	••				••				^e0.2	^af0.2			•	••	^e1.3	••	^af0.3	••	••	••	••			•		•					^e5.0	^e4.7			^e36.1			^g
Hong Kong																	•																			0.2			
India	0.2		••	••	••			••		••	0.2	0.2	••			••	1.2		0.1		16.8		^d12.1			•		••			••				••	••			^e0.1	
Indochina		••																														0.1							
Indonesia				4.4																						1.4						^e0.2							
Iran		0.3						••								1.0					0.1					^e0.2												
Iraq																										1.1												
Japan	2.1	0.5	0.1			2.4	^e2.1	^e1.5	••		1.9	1.7			0.1	2.1	0.4	1.0	0.8		^e2.3	2.0			0.4	•		•	2.9	21.6		0.4	0.4			0.4		1.4	3.2
Korea, North			••									••			••		••	••	••		••							•								2.2			
Korea, Republic of			••		•	5.5					•	•			0.5	^e.1	•	•	•		••		•	••				•		0.3						6.3		•	
Kuwait																										6.1												
Malaya				0.2						3.1			••				0.3															32.8	36.7	^g2.5		0.1			
Pakistan								0.5									0.4	0.1			0.3																	0.1	
Philippines								17.0			0.5						^e.3				1.5																		
Port. India																										0.6												
Quatar		••									••															0.9												
Sarawak and Brunei																										6.7												
Saudi Arabia	0.2		•	••							••	•				0.4				••			•			•			0.1	0.1						^e2.9		•	
Taiwan		0.2															•	0.1														5.5							
Thailand		3.0						^e19.8									0.2	^e0.1			1.3	••				•			0.1									••	
Turkey			••	••		••		^e16.8			0.8	0.5	••		••	••	1			••		••		••				••		••										
U. S. S. R.																																						
Total	2.5	21.4	0.1	4.6	•	7.9	2.1	57.6	••	3.1	3.5	2.9	••		0.6	14.9	3.0	2.4	1.3	••	22.3	2.0	12.1	0.4	••	19.2	••	••	3.3	22.1		56.5	41.8	2.5	••	50.5		1.8	3.2
Oceania:																																						
Australia		0.4	0.3	0.1	1.4	0.1	4.7	••	••		0.7	0.6			•	••	0.9	12.7	11.0		^e0.1		0.4	•			•	•		0.5	16.5	0.9	1.0	••	82.5	^e3.6		7.9	4.0
Fiji Islands								3.4									••				••																		
New Caledonia																	••				0.2				6.0														
New Guinea		••	••																							•	•												
New Zealand																	••				••					•	•								^e0.1				
Papua																					•																		
Total		0.4	0.3	0.1	1.4	0.1	4.7	3.4	••		0.7	0.6			•	••	0.9	12.7	11.0		0.3		0.4	•	6.0	•	••	•		0.5	16.5	0.9	1.0	••	82.5	3.7		7.9	4.0
Unidentified	1.2	5.8	16.7	16.2	3.5	47.1	0.0	2.9	6.0	2.9	0.9	1.2	61.6	0.1	13.9	38.1	0.5	1.8	2.0	27.5	2.1	10.5	21.6	2.6	0.0	0.0	0.0	22.0	3.4	14.7	4.6	0.1	0.0	25.7	16.8	0.2		0.6	0.3
Total	100	^h100	100	100	^h100	100	100	100	^h100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	^h100	^h100	100	100	^h100		100	100
WORLD TOTALS	2,090,000 M.T.	145,000 M.T.	1,445,000 M.T.	12,837,000 M.T.	3,200 S.T.	1,600,000 Kgs.	6,280,000 Kgs.	3,250,000 M.T.	10,000 M.T.	3,400,000 Lbs.	2,735,000 M.T.	2,730,000 M.T.	10,000 M.T.	15,800,000 M.C.	1,190,000 M.T.	130,000 M.T.	297,000,000 M.T.	1,820,000 M.T.	1,795,000 M.T.	181,000 M.T.	7,700,000 M.T.	150,000 Flks.	120,000 M.T.	27,000 M.T.	173,000 M.T.	4,498,087 1000 bbls.	675,000 T.Oz.	5,599,000 M.T.	6,000,000 L.T.	1,575,000 M.T.	98,000 Lbs.	173,000 L.T.	178,800 L.T.	893,000 M.T.	47,000 MT.	55,400 M.T.	no total	2,520,000 M.T.	2,190,000 M.T.

* Less than 0.15.
•• Data not available, estimate included in total.
a/ Estimate.
b/ Small quantity of tantalite is included in the columbium figure.
c/ United States imports.
d/ Exports.
e/ Data for Soviet Zone of Austria included in total.
f/ Includes scrap.
g/ Spanish Morocco is included in the Spanish figure.
h/ U. S. S. R. in Europe included with U. S. S. R. in Asia.
i/ U. S. S. R. in Asia included with U. S. S. R. in Europe.
j/ U. S. S. R. not included in world total.

Foreign Minerals Statistical Section
Section IX
Bureau of Mines
Department of Interior
October 1953

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MINERAL POSITION—ACTUAL, POTENTIAL, AND POTENTIAL

(Based on "commercial" reserves, outlook for noteworthy discovery, and the possibility that known submarginal resources can be made available by technologic progress and improved economic conditions)

RELATIVE SELF-SUFFICIENCY

UNITED STATES

ACTUAL AND DEPENDING

(Based on present technologic and economic conditions and on "commercial" reserves)

A. VIRTUAL SELF-SUFFICIENCY ASSURED FOR A LONG TIME:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Arsenic
Gallium
Indium
Magnesium
Molybdenum
Tellurium
Thallium
Titanium (ilmenite)
Zirconium
Boron minerals
Bromine
Lithium (spodumene)
Nitrates
Phosphate rock
Potash
Salt
Steatite talc (for grinding)
Sulfur

B. COMPLETE OR VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

1. Small or remote expectation of improving position through discovery:

Beryllium
Chromite
Manganese
Nickel
Platinum metals
Tin
Asbestos
Corundum
Diamonds (industrial)
Graphite (strategic)
Jewel bearings
Kyanite (strategic)
Mica (strategic)
Quartz crystal (radio grade)
Steatite talc (block)

2. Good expectation of improving position through discovery:

Columbium-Tantalum
Strontium minerals

3. Good expectation of improving position through synthesis:

Corundum
Kyanite (strategic)
Mica (strategic)
Quartz crystal (radio grade)
Steatite talc (block)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES, ACTUAL OR DEPENDING:

1. Good expectation of improving position through discovery:

Cadmium
Cobalt
Copper
Germanium
Gold
Iron ore
Lead
Mercury
Rare earth metals
Selenium
Silver
Tungsten
Zinc
Barite
Fluorspar
Iodine

2. Little hope of improving position through discovery:

Aluminum ore
Antimony
Bismuth
Cesium-Rubidium
Titanium (rutile)

POTENTIAL

(If technologic and economic changes permit use of known submarginal resources)

A. VIRTUAL SELF-SUFFICIENCY:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Aluminum ores
Arsenic
Beryllium
Gallium
Germanium
Indium
Iron ore
Magnesium
Manganese
Molybdenum
Rare earth metals
Selenium
Tellurium
Thallium
Titanium (ilmenite)
Titanium (rutile)
Zirconium
Barite
Boron minerals
Bromine
Corundum
Graphite (strategic)
Iodine
Jewel bearings
Kyanite (strategic)
Lithium (spodumene)
Nitrates
Phosphate rock
Potash
Quartz crystal (radio grade)
Salt
Steatite talc (for grinding)
Steatite talc (block)
Strontium minerals
Sulfur

B. COMPLETE OR VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

Nickel
Platinum metals
Tin
Asbestos
Diamonds (industrial)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES:

Antimony
Bismuth
Cadmium
Cesium-Rubidium
Chromite
Cobalt
Columbium-Tantalum
Copper
Gold
Lead
Mercury
Silver
Tungsten
Zinc
Fluorspar
Mica (strategic)

UNITED STATES, CANADA AND PERU

ACTUAL AND DEPENDING

(Based on present technologic and economic conditions and on "commercial" reserves)

A. VIRTUAL SELF-SUFFICIENCY ASSURED FOR A LONG TIME:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Arsenic
Cadmium
Gallium
Gold
Indium
Lead
Magnesium
Molybdenum
Nickel
Selenium
Silver
Tellurium
Thallium
Titanium (ilmenite)
Zinc
Zirconium
Barite
Boron minerals
Bromine
Corundum
Graphite (strategic)
Iodine
Jewel bearings
Kyanite (strategic)
Lithium (spodumene)
Nitrates
Phosphate rock
Potash
Salt
Steatite talc (for grinding)
Sulfur

B. COMPLETE OR VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

1. Small or remote expectation of improving position through discovery:

Beryllium
Chromite
Manganese
Tin
Corundum
Diamonds (industrial)
Graphite (strategic)
Jewel bearings
Kyanite (strategic)
Mica (strategic)
Quartz crystal (radio grade)
Steatite talc (block)

2. Good expectation of improving position through discovery:

Columbium-Tantalum

3. Good expectation of improving position through synthesis:

Corundum
Kyanite (strategic)
Mica (strategic)
Quartz crystal (radio grade)
Steatite talc (block)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES, ACTUAL OR DEPENDING:

1. Good expectation of improving position through discovery:

Antimony
Bismuth
Cobalt
Copper
Germanium
Iron ore
Mercury
Platinum metals
Rare earth metals
Tungsten
Asbestos
Fluorspar
Iodine
Strontium minerals

2. Little hope of improving position through discovery:

Aluminum ore
Cesium-Rubidium
Titanium (rutile)

POTENTIAL

(If technologic and economic changes permit use of known submarginal resources)

A. VIRTUAL SELF-SUFFICIENCY:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Aluminum ores
Antimony
Arsenic
Beryllium
Cadmium
Copper
Gallium
Germanium
Gold
Indium
Iron ore
Lead
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Rare earth metals
Selenium
Silver
Tellurium
Thallium
Titanium (ilmenite)
Titanium (rutile)
Zinc
Zirconium
Barite
Boron minerals
Bromine
Corundum
Fluorspar
Graphite (strategic)
Iodine
Jewel bearings
Kyanite (strategic)
Lithium (spodumene)
Nitrates
Phosphate rock
Potash
Quartz crystal (radio grade)
Salt
Steatite talc (for grinding)
Steatite talc (block)
Strontium minerals
Sulfur

B. DEPENDENCE ON VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

Tin
Bismuth (industrial)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES:

Bismuth
Cesium-Rubidium
Chromite
Cobalt
Columbium-Tantalum
Platinum metals
Tungsten
Asbestos
Mica (strategic)

CANADIAN RESOURCES

ACTUAL AND DEPENDING

(Based on present technologic and economic conditions and on "commercial" reserves)

A. VIRTUAL SELF-SUFFICIENCY ASSURED FOR A LONG TIME:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Aluminum ores
Antimony
Arsenic
Beryllium
Bismuth
Cadmium
Copper
Gallium
Gold
Indium
Iron ore
Lead
Magnesium
Molybdenum
Nickel
Platinum metals
Rare earth metals
Selenium
Silver
Tellurium
Thallium
Titanium (ilmenite)
Zinc
Zirconium
Barite
Boron minerals
Bromine
Lithium (spodumene)
Nitrates
Phosphate rock
Potash
Quartz crystal (radio grade)
Salt
Steatite talc (for grinding)
Sulfur

B. COMPLETE OR VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

1. Small or remote expectation of improving position through discovery:

Chromite
Corundum
Diamonds (industrial)
Graphite (strategic)
Jewel bearings
Kyanite (strategic)
Steatite talc (block)

2. Good expectation of improving position through discovery:

3. Good expectation of improving position through synthesis:

Corundum
Kyanite (strategic)
Steatite talc (block)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES, ACTUAL OR DEPENDING:

1. Good expectation of improving position through discovery:

Cesium-Rubidium
Cobalt
Columbium-Tantalum
Germanium
Manganese
Mercury
Tin
Titanium (rutile)
Tungsten
Asbestos
Fluorspar
Iodine
Mica (strategic)
Strontium minerals

POTENTIAL

(If technologic and economic changes permit use of known submarginal resources)

A. VIRTUAL SELF-SUFFICIENCY:

Anthracite
Bituminous coal and lignite
Helium
Natural gas
Petroleum
Aluminum ores
Antimony
Arsenic
Beryllium
Bismuth
Cadmium
Cesium-Rubidium
Copper
Gallium
Germanium
Gold
Indium
Iron ore
Lead
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Platinum metals
Rare earth metals
Selenium
Silver
Tellurium
Thallium
Titanium (ilmenite)
Titanium (rutile)
Zinc
Zirconium
Barite
Boron minerals
Bromine
Corundum
Fluorspar
Graphite (strategic)
Iodine
Jewel bearings
Kyanite (strategic)
Lithium (spodumene)
Mica (strategic)
Nitrates
Phosphate rock
Potash
Quartz crystal (radio grade)
Salt
Steatite talc (for grinding)
Steatite talc (block)
Strontium minerals
Sulfur

B. COMPLETE OR VIRTUAL DEPENDENCE ON FOREIGN SOURCES:

Diamonds (industrial)

C. PARTIAL DEPENDENCE ON FOREIGN SOURCES:

Chromite
Cobalt
Columbium-Tantalum
Tin
Tungsten
Asbestos

Prepared by the Bureau of Mines
Washington, D. C.
October 15, 1953

Percent of world production of selected metallic minerals, United States and leading foreign producers, 1952

	Percent
Antimony ore: [1]	
United States	4. 3
Bolivia	21. 3
China [2]	17. 4
Union of South Africa	15. 7
Mexico	12. 0
Yugoslavia	5. 9
Turkey	3. 0
Others	20. 4
Total	100. 0
Bauxite:	
United States	13. 2
Surinam	24. 6
British Guiana	18. 9
France	8. 7
Hungary [2]	8. 5
U. S. S. R.[2]	7. 0
Yugoslavia	4. 5
Indonesia	4. 4
Others	10. 2
Total	100. 0
Chromite ore:	
United States	0. 6
Turkey [2]	19. 8
U. S. S. R.[2]	18. 8
Union of South Africa	18. 1
Philippines	17. 0
Southern Rhodesia	10. 1
India [2]	8. 0
Others	7. 6
Total	100. 0
Cobalt: [1]	
United States	3. 8
Belgian Congo	68. 3
French Morocco	10. 0
Canada	5. 9
Northern Rhodesia	5. 9
Others	6. 1
Total	100. 0
Columbium:	
United States	[3] 0. 2
Nigeria	85. 2
Belgian Congo	6. 8
Malaya	3. 1
Others	4. 7
Total	100. 0
Tantalum:	
United States	(3)
Brazil	52. 4
Australia	16. 5
Southern Rhodesia	10. 9
Union of South Africa	8. 4
Tantalum—Continued	
South-West Africa	4. 6
Others	7. 2
Total	100. 0
Copper:	
United States	30. 7
Chile	14. 8
Northern Rhodesia	12. 0
U. S. S. R.[2]	10. 8
Canada	8. 5
Belgian Congo	7. 5
Mexico	2. 1
Others	13. 6
Total	100. 0
Iron ore:	
United States	33. 5
U. S. S. R.[2]	16. 8
France	13. 9
Sweden	5. 9
United Kingdom	5. 5
West Germany	5. 2
Luxembourg	2. 4
Others	16. 8
Total	100. 0
Lead:	
United States	19. 4
Mexico	13. 5
Australia	12. 7
U. S. S. R.[2]	8. 5
Canada	8. 2
Peru	5. 4
French Morocco	4. 6
Yugoslavia	4. 3
South-West Africa	2. 9
West Germany	2. 8
Spain [4]	2. 4
Italy	2. 2
Others	13. 1
Total	100. 0
Magnesium:	
United States	63. 6
U. S. S. R.[2]	26. 4
Canada	3. 3
United Kingdom	3. 2
Others	3. 5
Total	100. 0
Manganese ore:	
United States	1. 4
U. S. S. R.[2]	32. 5
India	16. 8
Union of South Africa	11. 4
Gold Coast	10. 3

See footnotes at end of table, p. 152.

Percent of world production of selected metallic minerals, United States and leading foreign producers, 1952—Continued

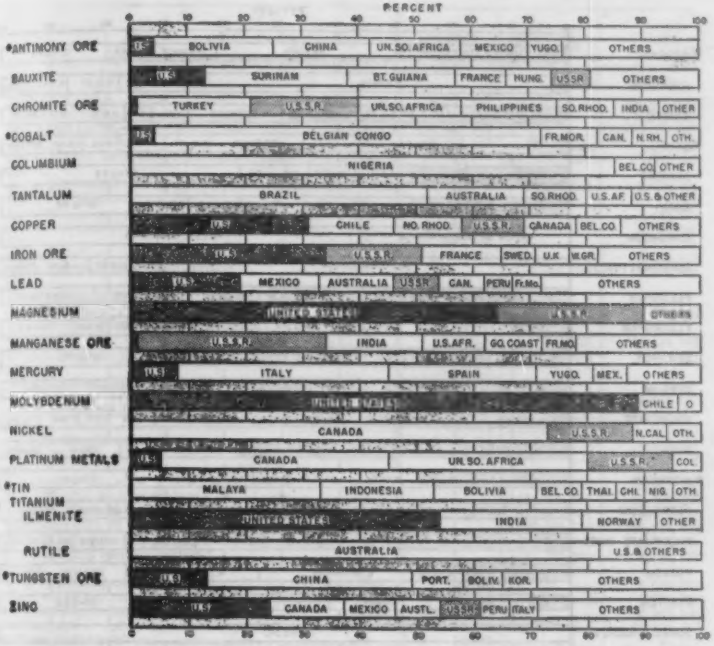
	Percent
Manganese ore—Continued	
French Morocco	5.5
Cuba [2]	3.3
Egypt	2.7
Japan [2]	2.3
Brazil [2]	2.1
Others	11.7
Total	100.0
Mercury:	
United States	8.4
Italy	37.2
Spain	26.1
Yugoslavia	9.7
Mexico	5.8
Others	12.8
Total	100.0
Molybdenum:	
United States	88.4
Chile	7.4
Others	4.2
Total	100.0
Nickel:	
United States	0.3
Canada	73.4
U. S. S. R.	14.5
New Caledonia [2]	6.0
Cuba	4.7
Others	1.1
Total	100.0
Platinum metals:	
United States	5.1
Canada	39.9
Union of South Africa	35.3
U. S. S. R. [2]	14.8
Colombia	4.9
Total	100.0
Tin:	
United States [1]	0.1
Malaya	32.8
Indonesia	20.2
Bolivia	18.5
Belgian Congo	8.0
Thailand	5.5
China [2]	5.0

	Percent
Tin—Continued	
Nigeria	4.8
Others	5.1
Total	100.0
Titanium:	
Ilmenite:	
United States	53.7
India [2]	25.2
Norway	13.2
Canada	4.3
Malaya	2.5
Others	1.1
Total	100.0
Rutile:	
United States	(5)
Australia	82.5
Others	17.5
Total	100.0
Tungsten ore: [1]	
United States	12.5
China [2]	36.1
Portugal	8.8
Bolivia	6.7
Korea, Republic of	6.3
Spain	4.3
Australia [2]	3.6
Brazil [2]	3.2
Thailand [2]	2.9
Others	15.6
Total	100.0
Zinc:	
United States	24.0
Canada	13.2
Mexico	9.0
Australia	7.9
U. S. S. R. [2]	7.4
Peru	4.8
Italy	4.5
Belgian Congo	3.9
Poland [2]	3.8
Japan	3.4
Spain [2]	3.3
West Germany	3.2
Others	11.6
Total	100.0

[1] U. S. S. R. not included in world total.
[2] Estimate.
[3] A small quantity of tantalite is included in the columbite concentrates
[4] Spanish Morocco is included in the Spanish figure.
[5] Data not available, estimate included in total.

Source: Foreign Minerals Statistical Section, Region IX, Bureau of Mines, Department of Interior. Based on a table prepared October 1953.

PERCENT OF WORLD PRODUCTION OF SELECTED STRATEGIC METALLIC MINERALS
UNITED STATES AND LEADING FOREIGN PRODUCERS, 1952


PERCENT
0 10 20 30 40 50 60 70 80 90 100
*ANTIMONY ORE
U.S. BOLIVIA CHINA UN. SO. AFRICA MEXICO YUGO. OTHERS
BAUXITE
U.S. SURINAM BT. GUIANA FRANCE HUNG. U.S.S.R. OTHERS
CHROMITE ORE
TURKEY U.S.S.R. UN. SO. AFRICA PHILIPPINES SO. RHOD. INDIA OTHER
*COBALT
U.S. BELGIAN CONGO FR. MOR. CAN. N. RH. OTH.
COLUMBIUM
NIGERIA BEL. CO. OTHER
TANTALUM
BRAZIL AUSTRALIA SO. RHOD. U.S. AF. U.S. & OTHER
COPPER
U.S. CHILE NO. RHOD. U.S.S.R. CANADA BEL. CO. OTHERS
IRON ORE
U.S. U.S.S.R. FRANCE SWED. U.K. W. GR. OTHERS
LEAD
U.S. MEXICO AUSTRALIA U.S.S.R. CAN. PERU Fr. Mo. OTHERS
MAGNESIUM
U.S. U.S.S.R. OTHERS
MANGANESE ORE
U.S.S.R. INDIA U.S. AFR. GO. COAST FR. MO. OTHERS
MERCURY
U.S. ITALY SPAIN YUGO. MEX. OTHERS
MOLYBDENUM
U.S. CHILE O
NICKEL
CANADA U.S.S.R. N. CAL. OTH.
PLATINUM METALS
U.S. CANADA UN. SO. AFRICA U.S.S.R. COL.
*TIN
MALAYA INDONESIA BOLIVIA BEL. CO. THAI. GHI. NIG. OTH.
TITANIUM ILMENITE
U.S. INDIA NORWAY OTHER
RUTILE
AUSTRALIA U.S. & OTHERS
*TUNGSTEN ORE
U.S. CHINA PORT. BOLIV. KOR. OTHERS
ZINC
U.S. CANADA MEXICO AUSTL. U.S.S.R. PERU ITALY OTHERS
0 10 20 30 40 50 60 70 80 90 100

*U.S.S.R. NOT INCLUDED IN WORLD TOTAL

PREPARED BY FOREIGN MINERALS REGION, U.S. BUREAU OF MINES

PERCENT OF WORLD PRODUCTION OF SELECTED NONMETALLIC MINERALS UNITED STATES AND LEADING FOREIGN PRODUCERS, 1952

*U.S.S.R. NOT INCLUDED IN WORLD TOTAL

PREPARED BY FOREIGN MINERALS REGION, U.S. BUREAU OF MINES

United States imports for consumption, 1953 (exclusive of material for smelting, refining, and export)

[Source: U. S. Department of Commerce (Census)]

	Quantity	Quantity (content)	Value
Aluminum:			
Bauxite, crude, long tons	4,388,623		$39,587,943
Bauxite, calcined, do	91,606		2,116,121
Metal and alloys, crude (ingots, pigs, etc.), pounds	601,855,243		115,761,297
Scrap, do	53,242,865		8,072,379
Plates, sheets, bars, etc., do	63,863,070		18,636,894
Antimony:			
Ore (gross weight and antimony content), do	34,483,390	15,555,208	2,035,125
Needle or liquated, do	33,920		8,678
Regulus, do	5,223,580		1,402,226
Beryllium, do	16,486,705		3,881,242
Bismuth, do	641,428		1,273,417
Cadmium metal, do	1,555,140		2,673,853
Cadmium flue dust (cadmium content), do		1,863,538	1,586,895
Chrome:			
Chemical grade (gross weight and Cr_2O_3 content, short tons	264,968	91,087	2,033,620
Metallurgical grade (gross weight and Cr_2O_3 content), short tons	1,393,279	643,625	45,318,692
Refractory grade (gross weight and Cr_2O_3 content), do	628,363	207,913	8,688,407
Cobalt:			
Ore and concentrates (gross weight and cobalt content), pounds	5,694,850	2,464,126	4,951,551
Metal, do	15,463,936		33,224,674
Oxide, do	610,054		979,541
Columbium ore and concentrates, do	4,192,694		6,905,497
Tantalum ore, do	752,795		1,208,134
Copper:			
Ore (copper content), do		11,495,593	3,161,165
Concentrates (copper content), do		194,538,646	53,406,756
Regulus, blackets (copper content), do		13,203,851	4,071,618
Unrefined pigs, or converter bars (copper content), do		557,179,856	178,734,026
Refined in ingots (copper content), do		549,526,419	182,681,681
Old and scrap (copper content), do		15,654,738	4,017,577
Fluorspar:			
Over 97 percent calcium fluoride, long tons	186,645		8,778,074
Not over 97 percent calcium fluoride, do	135,517		2,757,283
Ilmenite ore (including ilmenite sand), pounds	573,287,653		5,463,526
Iron ore, do	11,084,185		90,896,983
Dross from burnt pyrites, do	12,053		54,172
Lead:			
Ores, flue dust and mattes (lead content), do		133,708,126	15,109,138
Bullion or base bullion (lead content), do		1,483,609	294,068
Pigs and bars (lead content), do		758,081,972	95,291,944
Scrap, dross, etc. (lead content), do		7,319,665	824,997
Magnesium:			
Metallic and metallic scrap, do	4,886,178		877,130
Alloys (magnesium content), do		4,654	15,537
Powder (magnesium content), do		174	237
Sheets, tubing, etc. (magnesium content), do		9,678	19,746
Manganese:			
Over 10, less than 35 percent (gross weight and Mn content), pounds	370,465,876	83,958,271	2,124,037
35 percent and over:			
Battery and chemical grade (gross weight and Mn content), pounds	190,218,379	102,557,940	4,573,956
Metallurgical grade (gross weight and Mn content), pounds	6,039,328,667	2,683,442,633	98,946,089
Mercury, do	6,337,886		13,568,576
Molybdenum ore and concentrates, do			
Nickel:			
Ore and matte, do	29,209,949		5,794,264
Oxide, do	59,680,417		26,155,102
Pigs, ingots, etc., do	171,169,201		102,770,531
Bars, rods, etc., do	661,375		1,329,762
Bars, rods, cold-rolled, do	28,618		37,901
Tubes and tubing, do	5,639		5,067
Platinum:			
Ores and concentrates (platinum metals content), troy ounces		1,512	54,300
Grains and nuggets (platinum content), do		45,950	3,419,658
Sponge and scrap (platinum content), do		108,944	8,352,701
Ingots, bars, etc. (platinum content), do		232,483	21,042,584
Iridium (iridium content), do		1,643	251,908
Osmium (osmium content), do		583	67,126
Osmiridium (osmium plus iridium content), do		1,814	174,577
Palladium (palladium content), do		227,080	4,548,460
Rhodium (rhodium content), do		12,224	1,314,571
Ruthenium (ruthenium content), do		3,201	210,152

United States imports for consumption, 1953 (exclusive of material for smelting, refining, and export)—Continued

	Quantity	Quantity (content)	Value
Rutile.....pounds..	32, 195, 541	.....	$1, 791, 66
Selenium and salts.....do....	99, 855	.....	456, 66
Tin:			
Ore (tin content).....long tons..	.....	35, 973	82, 713, 39
Bars, blocks, pigs, etc.....do....	74, 538	.....	175, 856, 28
Metallic scrap.....do....	363, 803	.....	198, 63
Alloys chief value tin (including alloyed scrap).....do....	15, 326, 483	.....	11, 646, 88
Titanium (see ilmenite and rutile).			
Tungsten, ore and concentrates (gross weight and tungsten content.....pounds..	57, 320, 865	27, 923, 573	91, 049, 57
Zinc:			
Zinc-bearing ores (zinc content).....do....	.....	898, 881, 252	47, 929, 63
Old and worn out.....do....	5, 979, 975	.....	306, 06
Dross and skimmings.....do....	5, 849, 294	.....	250, 34
Blocks, pigs, or slabs.....do....	455, 187, 461	.....	50, 270, 32

WESTERN HEMISPHERE SELF SUFFICIENCY

Pertinent to the ability of the United States to become self-sufficient in strategic raw materials during the time of a war is a letter received by the committee chairman from Herbert Hoover dated February 20, 1954, which reads as follows:

THE WALDORF ASTORIA TOWERS,
New York, N. Y., February 20, 1954.

The Honorable GEORGE MALONE,
United States Senate, Washington, D. C.

MY DEAR SENATOR: As you know, I have felt that I was not properly equipped to give valuable information to your committee. For 6 months I have given my undivided time and thought to the work of the congressional directive—the Commission on Organization of the Executive Branch of the Government—except for 1 week's holiday. Therefore, I have not had the time for such research and preparation which, I believe, a Senate committee hearing deserves. Of course, I have some information arising from my profession of years ago, but I have not been able, nor have I the facilities, to check it as the committee would deserve.

Subject to research and checkup, I believe that with the proper encouragement the Western Hemisphere could be so developed as to produce the following raw materials in sufficient quantities for our defense in a war without our going further overseas. They are: Coal, iron, manganese, copper, lead, zinc, nickel, aluminum, silver, tungsten, uranium, chrome, titanium, vanadium, antimony, molybdenum, quartz crystals, and mica. We could develop more tin in Latin America, and no doubt in war could use many substitutes.

There would appear to be supplies of petroleum, hemp, and wood. Obviously we could produce synthetic substitutes for rubber, silk, and possibly wool.

In foodstuffs, there would seem to be in this hemisphere ample supplies of everything but tea, cocoa, and some vegetable oils. Of the latter, we could expand our tung-oil production and could stimulate our other edible oils to sufficiency, such as we did during the last war.

One of the surest things to do is to further stockpile these materials for the dual purpose of stimulating Western Hemisphere production and to have adequate defense supplies on hand.

Yours faithfully,

HERBERT HOOVER.

STOCKPILE

The strategic and critical material stockpile provides for the accumulation and storage against foreseeable deficits for various critical materials of proper quantity and quality to meet essential wartime needs. The size of the stockpile is based on the amount of each material required to supplement the "going-concern" production available to the Nation in time of war. The stockpile together with the "going-concern" production in the Western Hemisphere must equal the wartime needs.

It was apparent to thoughtful persons after the First World War that as a defense measure steps had to be taken to accumulate a reserve supply of strategic and critical materials, either by the Government or private companies, to be available in time of emergency.

Congress recognized the necessity for a stockpile and for the need of stimulating domestic production of critical materials. Public Law 117 was enacted in 1939 as a modest beginning of a stockpiling program for which the sum of only $100 million was appropriated.

The following section condenses witnesses' testimony on the subject of stockpiling:

BASIC STOCKPILE ACT, PUBLIC LAW 520

With the experience gained through Public Law 117, Congress enacted the present basic stockpile law, Public Law 520, approved July 23, 1946. In essence it provides that, due to the deficiencies and insufficient development of the natural resources of the United States in certain strategic and critical materials necessary for the military and other needs of the country for common defense it is the policy of the Congress and the purpose and intent of the Stockpile Act to provide for the—

1. Acquisition and retention of stocks of strategic and critical materials;

2. Encouragement of conservation and development of the sources of these strategic and critical materials within the United States and thereby decrease and prevent wherever possible the dangerous and costly dependence of the United States upon foreign nations for the supplies of these materials in times of national emergency;

3. The act further provides for the creation of an industry advisory committee and designated the Secretaries of War, Navy and Department of Interior to purchase and acquire these stockpiles. (The functions of the cabinet secretaries were later delegated to the Munitions Board, now the Office of Defense Mobilization);

4. The act further provided that we buy American. (Sec. 3 (a) 2) (title III, act of March 3, 1933 (47 Stat. 1520).)

PRIMARY CONGRESSIONAL INTENT THAT WE ENCOURAGE NATIVE DEVELOPMENT OF RESOURCES

Congress recognized the importance of a healthy and vigorous critical mineral and material industry as paramount to the stockpile

itself. There is no field more determinative in the area of national security than the field of strategic and critical materials. The Stockpile Act laid particular emphasis on the fact that it was necessary "to encourage the development of sources of strategic and critical materials within the United States and thereby decrease and prevent the dangerous and costly dependence of this country upon foreign nations for critical materials in time of war." Testimony showed that a drive has been made, evidently sponsored by the State Department, to eliminate the "Buy-American" features of the Stockpile Act. Congress, however, insisted that the bill contain the Buy-American feature.

ADMINISTRATION CIRCUMVENTION OF BUY AMERICAN ACT

President Truman, when he signed the 1946 Stockpile Act, issued a statement in which he said it was only because of the overriding importance of the act that he was able to overcome his reluctance in signing a bill with the buy-American provision and the President pointed out ways of avoiding the buy-American section and enumerated policies to be followed by the administrative agencies in the following words:

> Those provisions will * * * tend to defeat the conservation and strategic objectives of the bill by further depleting our already inadequate underground reserves of strategic materials. Furthermore, there can be a serious conflict between those provisions and the foreign economic policy which this Government is actively pursuing.
>
> This provision clearly indicates that the stockpiling program should not be used as a means of generally subsidizing those domestic producers who otherwise could not compete successfully with other domestic or foreign producers. * * *
>
> It is the policy of this Government to work for international action to reduce trade barriers. * * * (Hearings, pt. 2, p. 11)
>
> Encouragement of unnecessary domestic production and unjustified preferential treatment of domestic producers destroys trade and so undermines our national economic strength. * * *

According to the witness the above statement by President Truman was the key which explained the actions of the administrative agencies in failing to carry out the directive of Congress to encourage the development of domestic sources of strategic and critical materials and to endeavor to make the United States as independent as possible of foreign sources of supply.

THE BACKGROUND OF THE PRESIDENT'S DECISION

The loyalty of President Truman is beyond question and any criticism of his attitude on the Buy American Act in no way impugns his motivation.

The witness stated that the question is, who misled the President, who gave him the advice to encourage the circumvention of the Buy American Act. They allege the proof is documented and placed in evidence before this committee (pt. II, p. 657). This documentation is known as the Harry Dexter White memoranda dated March 7, 1944, and obtained from the Princeton University Library and the files of the Treasury Department. (See appendix IV, p. 370.)

Harry Dexter White, Assistant Secretary of the Treasury, on March 7, 1944, wrote a memorandum to the Secretary of the Treasury setting forth a table of the United States reserve domestic supplies of strategic materials as follows:

Reserve domestic supplies

	On the basis of our 1939 domestic consumption	On the basis of our current consumption, 1943
Petroleum	16 years' supply	13 years' supply.
Manganese	9 years' supply	3 years' supply.
Tungsten	23 years' supply	Do.
Zinc	17 years' supply	8 years' supply.
Lead	7 years' supply	6 years' supply.
Chrome	No record	Less than 1 year's supply.
Mercury	3 years' supply	

From this data he stated the premise:

Although our domestic reserves of petroleum, tungsten, and zinc may suffice to meet consumption requirements for the next decade, they will be almost entirely dissipated by the end of that period, meaning by the year 1954 or thereabouts.

From this premise Assistant Secretary White went on to draw the conclusion:

The necessity of growing United States dependence on foreign sources of supply in order to satisfy anticipated postwar industrial requirements and to maintain adequate security reserves is inescapable.

Secretary Morgenthau on January 10, 1945, wrote to the President forwarding the same table of alleged domestic reserves of domestic supplies and stated:

I suggest consideration be given to a financial arrangement with the U. S. S. R. to provide * * * repayment to us chiefly in strategic raw materials which are in short supply in the United States.

An important feature of this proposal is that we will be conserving our depleted natural resources by drawing on Russia's huge reserves. * * *

There is evidence he accepted the assumption that this country was getting dangerously low on our natural resources, and he acted with what he thought was the best interests of the country. In retrospect it is shown that White's conclusions, assumptions, theories, and policies, which made the United States dependent upon offshore foreign areas, principally Russia, for strategic materials, were false and untrue.

White's use of these statistical tables was either the result of gross ignorance or part of the machinations of an insidious, subversive policy to make this Nation dependent upon Russia and other offshore areas for the sources of our strategic and critical raw materials without which we could not fight a war. His association with communistic and subversive elements is well known and has been the subject of investigations of other legislative committees.

It is interesting to note that in 1947 [6] William Remington was chairman of the so-called secret ad hoc committee which was regulating the exports of strategic and critical materials from the United States, who when questioned concerning his reasons for approving certain strategic materials going to Russian satellite countries explained that it was a quid pro quo with Russia whereby she was delivering to us manganese without which we could not make any steel.

Testimony before this committee has established that we have all of the manganese we can use in the foreseeable future in the Western Hemisphere.

[6] William Remington was forced to resign from Government service because of his Communist activites, after Senator Malone pressed charges. Remington was later convicted in Federal court, on perjury charges, also arising out of his Communist activities.

It was testified that the President, relying on false and erroneous information circulated by White and others, reached a conclusion that he had to rely on Soviet Russia and other far-away nations for our critical minerals and fuels.

While he could not veto the Buy American Act without destroying the whole stockpile program of which it was a part, it is alleged that the President used his Executive authority to accomplish much the same result. It is to be noted in the hearings that there was a serious conflict between the buy-American features and the foreign economic policy which the Government was actively pursuing and he virtually instructed the executive departments to find means of making an end run around Congress.

BUY AMERICAN ACT

Witnesses alleged that the Buy American Act, which has been on the statute books since March 3, 1933, has been attacked by President Truman, the Paley Commission, and by the authors of the Bell report, and by President Eisenhower on March 30, 1954. Bills have been introduced in the 83d Congress to repeal this law. Henry Ford II, in an address before the Inland Daily Press Association in Chicago, Ill., in February 1953, said:

> * * * we should abandon the Buy American Act. The effect of that act is to prohibit the Federal and some State and local governments from buying foreign goods unless they are priced at least 25-percent under the lowest domestic bid. Very few importers can make that low a bid, particularly after paying customs duties on their products.
>
> The Federal Government alone now purchases about $20 billion worth of goods a years. Buy America may cost us as much as one-half billion dollars a year, according to one estimate. If Buy America provisions and pressures were dropped, as well as import duties, an important stimulus to imports and large savings to the taxpayer would result.
>
> Recently, for example, a foreign manufacturer, after paying a 45-percent import duty, underbid 2 American firms by substantially more than 25 percent on an Army contract. In subsequent bids, the Americans, oddly enough, were able to come down almost 50 percent. That brought them just within the 25-percent Buy American margin. The Army ultimately split the purchase between the American and foreign firms, saving you and me about half of the potential tax costs plus the import duties paid by the foreign firm—but appeasing at the same time the domestic producers.

The Buy American Act it was alleged can only be repealed, however, if accompanied by a reassumption by Congress of that regulation of foreign trade under article I, section 8, of the Constitution, and a concurrent repeal of the Walsh-Healey Act.

Government contractors furnishing equipment and material to the United States are governed by the Walsh-Healey Act, which enables the Secretary of Labor to establish minimum wages and other conditions of employment for anyone working on a Government contract, including subcontractors.

The minimum wages established under the Walsh-Healey Act may be far higher than those specified in the Fair Labor Standards Act. In fact, within wide limits they may be set at almost any point which the Secretary of Labor finds proper.

If this act is continued and the Buy American Act is repealed, American producers would be at a serious disadvantage competing with foreign bidders. Without the Buy American Act Government contracting officers would be required to accept the lowest bona fide bid.

This would have serious repercussions on certain domestic producers. For example, it is difficult to see how the New England textile industry could hope to secure business from the Quartermaster Corps in competition with European textiles without a Buy American Act, if the Walsh-Healey Act remains on the books. Unless the Buy American Act and the Walsh-Healey Act are considered together, it is difficult to see how anything but chaos can result.

Bills have been introduced in the 82d and 83d Congress to amend the Defense Production Act which would require the Secretary of Defense to give special preferences in the awarding of contracts to labor-surplus areas. If the Buy American Act is repealed, the sponsors of such measures must realize that no consideration could be afforded to labor surplus areas.

The Congress, in establishing the Small Business Administration, has directed that it assure small business its proper share of Government procurement. Special consideration for small business has been ordered in many Federal laws. If Government contracting officers are to be asked to purchase materials from the lowest bidder anywhere in the world, it is difficult to see how any special consideration for any particular class of American producer may be maintained.

Another conflict which would arise if the Buy American Act is repealed comes from the provisions of Public Law 520, 79th Congress, which provides for the acquisition of a military stockpile. A buy American clause was written in this law for the express purpose of developing and maintaining a going concern mining industry so that our dependence on foreign supplies could be lessened. If we are to continue in a world where strategic considerations are to be given first priority, it is again difficult to reconcile a repeal of the Buy American Act with the objectives set forth in Public Law 520.

AID FOR STRATEGIC MATERIALS EXPANSION PROGRAM—FOREIGN AND DOMESTIC COMPARED

One of the paramount features of Public Law 520, the Stockpiling Act, in addition to national defense was the encouragement of the expansion and development of native domestic sources for strategic and critical raw materials. The execution of this feature of Public Law 520 was at best only half-hearted, as already explained.

An analysis of the Federal assistance extended to the foreign minerals expansion program and to the domestic minerals expansion program shows that the Federal Government expended $594,126,000 on foreign mineral expansion programs from July 1, 1950, through March 1, 1953, which was $64 million more than was expended on a domestic minerals expansion program through the same period.[7]

By December 31, 1953, 80.1 percent of the material purchased for the stockpile was of foreign origin.[7]

These Government agencies, it is obvious, favored acquisitions for the stockpile from foreign sources of supply which resulted to the detriment of the exploration and development of some domestic sources of supply. These agencies made large-scale purchases of metals and minerals abroad and granted substantial financial assistance in developing foreign sources of raw materials. This financial

[7] Hearings, pt. II, pp. 23 to 27.

assistance could have been spent in developing, expanding, and exploring our own domestic sources and to help make this country independent of foreign offshore sources of supply.

MULTIPLICITY OF AGENCIES

The operation and policy guidance for the stockpile was beset until as recently as June 1953 by some 54 different boards and agencies of the Executive Department, all having a finger in the stockpiling operation. In addition there were 5 major interdepartmental committees and 9 legislative committees concerned with these operations as well as 10 major international groups whose operations impinged in one way or another upon our stockpile program.[8]

Congress in its original enactment of the law placed the responsibility for the acquisition of the stockpile in the hands of the Secretaries of State, Treasury, Agriculture, Commerce, War, Navy, Interior, and in the Munitions Board. This responsibility was changed and parcelled out to some 54 different agencies, boards, and Commissions through executive orders of the President.

The Federal Property and Administrative Services Act placed the housekeeping duties, that is the purchasing responsibilities and storage of strategic and critical materials for the stockpile, into the hands of the General Services Administration. In the main, the policy was left to the Munitions Board for a major portion of the time that the stockpile operation was carried on until it was succeeded by the Office of Defense Mobilization in June 1953.

In view of the numerous alphabetical agencies, mostly independent of each other, working at this job, it is surprising that the Emergency Procurement Service made the progress it did in accumulating the stockpile we now have.

The Munitions Board furnished the Emergency Procurement Service of the General Services Administration, purchasing directives. In its inception, it also controlled the price, quality, and time of purchase. Until 1948 the General Services Administration had to submit each contract to the Munitions Board for approval.

From 1948 to 1950 it relaxed the rule, and while the Munitions Board fixed the quality, quantity, and time of purchase, the Board directed the general purchase policy without scrutiny of each individual contract. After the Korean war started in 1950, the Munitions Board gave the General Services Administration broad powers in procurement policy on contracts to purchase, including prices to be paid.

General Services Administration generally is the housekeeper for the stockpile, retaining supervision over its care, warehousing, and turnover.

OFFICE OF DEFENSE MOBILIZATION

Since Reorganization Plan No. 3 was adopted in 1953, the policy powers have been centralized to a great degree in the Office of Defense Mobilization, and the number of boards and agencies of the executive department dealing with stockpiling have been reduced from 54 to 38 and the 5 major interdepartmental committees has now been reduced

[8] Hearing, pt. II, exhibit, p. 462.

to 1. There are still nine legislative committees concerned with the stockpiling operation.

The Office of Defense Mobilization now combines the activities of the National Security Resources Board and both the statutory and delegated functions of the former Office of Defense Mobilization. The Director of the Office of Defense Mobilization is now charged with the responsibility for major stockpiling actions through the transfer of stockpiling functions of the Munitions Board and the Department of Defense.

YARDSTICK FOR MEASURING OUR STOCKPILE OBJECTIVES

The Munitions Board, and now the Office of Defense Mobilization, was delegated the duty of fixing our stockpile objectives. They ascertained from various sources which items should be stockpiled.

Studies were made of the supply and consumption data of each material. This study was then projected into a hypothetical future full mobilization need by analyzing the requirements in time of war and the availability of the material from domestic and foreign sources.

This would be based on strategic and military assumptions as to the availability of supply in view of enemy action, and transportation problems, which would be furnished by the Chiefs of Staff and a political evaluation of each service by the State Department. It included possible enemy operations, political implications, and their effect on sources of supply. From this material analysis would be estimated wartime deficits, if any.

Generally the yardstick was the quantity of strategic and critical materials necessary to supply us in a national emergency of 5 years' duration at a consumption rate equal to an amount fixed by Defense Department and other experts from which quantity we were to deduct the amount of that material that we could reasonably expect to produce within our boundaries or within readily accessible neighboring lands in the 5-year emergency period.

COST OF STOCKPILE AND ACQUISITION RATE

At the time the stockpile law was passed in 1946, it was contemplated by Congress that the stockpile would be accumulated on the basis of a cost of $3 billion. The present estimate of the cost of the stockpile is more than double, and amounts to, roughly $7 billion.

The total value of the stockpile objectives at recent current price amounts to over $7 billion, which includes materials transferred to the stockpile from war surplus, the Economic Cooperation Administration, Mutual Security Agency, and other sources. At the time the law was passed, it was further contemplated that the stockpile should have been accumulated in 5 years' time,[9] which would have been approximately January 1953.

Examination of the inventory shows that on many items our inventory is far from complete, and the target date has been fixed on some items as far as 1958. The details are of a classified nature, and cannot be discussed in a public record, but are available to the Senate committee.

[9] Testimony of Thomas E. Martin, vol. 4, p. 5.

As late as December 31, 1953, 8 percent of our stockpile items show an attainment of less than 20 percent of the objective; an additional 27.5 percent of the items for the stockpile show an attainment of 40 to 60 percent of the objective; 14.5 percent of the stockpile objective is 60 to 80 percent complete, while the balance of 50 percent of the items are over 80 percent completed.

It is expected and hoped that with the concentration of the policy-making powers in the hands of the Office of Defense Mobilization that every effort will be made to complete the stockpile objectives as rapidly as possible. There are several items in which the situation is acute but in the interest of security they cannot be discussed in a public record. It is the intention of the members of this committee to scrutinize the levels of the stockpile from time to time and to watch its progress closely.

Dr. Arthur S. Flemming, Director of the Office of Defense Mobilization stated that the Office of Defense Mobilization intends to keep in mind:

1. The specific objectives of developing a procurement program that will result in achieving our stockpile objectives in the shortest possible time without interfering with the current defense program and without creating undue hardship on the civilian economy.
2. To develop a procurement program that will make the maximum contribution to strengthening our domestic sources of supply.
3. To develop a procurement program that will keep the United States in a position where it can continue to turn to foreign sources of supply in those areas where we know it will be impossible to rely completely on domestic sources of supply.
4. To develop a procurement program that will enable the procurement agencies, namely the General Services Administration to make purchases in a most economical manner.

Dr. Flemming also assured the committee that the Office of Defense Mobilization, in addition to its stockpiling responsibilities, will carry forward a materials expansion program under the authority conferred upon the Office of Defense Mobilization by the Defense Production Act with the intent to authorize expansion programs wherever needed which will help us achieve our stockpile objectives, and at the same time help us to mobilize our defense forces.

Last but not least he said he would carry forward programs that will encourage wherever possible the development of sources of critical materials within the United States and thereby decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations for supplies of these materials in times of national emergency.

THE OPERATIONS OF THE INTERNATIONAL MATERIALS CONFERENCE AND ITS EFFECT ON THE STOCKPILING OPERATIONS

The International Materials Conference had no legal basis and was conceived and organized by the State Department without congres-

27.5 percent of the items for the stockpile show an attainment of

sional assent. (See exhibit 33, p. 1069, hearings, pt. 4.)

The International Materials Conference had a strong impact on our stockpile and its operations resulted in restrictions, withdrawals and diversions from the stockpile.

Under the stockpiling law of this country the then Munitions Board and not the State Department or the International Materials Conference was charged with the responsibility of carrying out the congressional mandate relating to the stockpile. A more detailed statement concerning the International Materials Conference will follow.

INTERNATIONAL MATERIALS CONFERENCE RESTRICTED UNITED STATES STOCKPILING

Congress prohibited the use of funds by the State Department for participation in the International Materials Conference whereupon the Defense Production Administration assumed participation. There is clear evidence through admissions by the Defense Production Administration that they accepted the dictates of the International Materials Conference on the quantity of certain strategic materials which the United States could stockpile.

In effect, we have the situation where a de facto organization, the International Materials Conference, consisting of representatives of foreign nations, was dictating to the Government of the United States how much we could stockpile. This was in complete contradiction to the intent of Congress which had delegated the authority to fix the objectives and amount of stockpiling to the Munitions Board.

LEGALITY OF THE INTERNATIONAL MATERIALS CONFERENCE WAS CRITICIZED BY CONGRESS

The legality of the establishment of the International Materials Conference insofar as the United States is concerned was studied by Members of Congress, and Congressman Joseph Martin appointed several committees to check into the operations of the International Materials Conference. One of these committees is known as the Bow committee.

On June 15, 1952, the Bow committee released a report in which it declared the International Materials Conference to be in the nature of a supercartel with unlimited powers, and pointed out that similar programs were rejected twice by Congress; that the International Materials Conference was the brain child of the State Department; and in its report the Bow committee charged that the International Materials Conference blocked the stockpiling program of the United States. (Hearings, pt. 4, p. 1069.)

There is evidence that the allocations of the minerals and metals made by this extralegal International Materials Conference Committee to the nations of the world including our own were accepted and implemented by the Defense Production Administration which had the power to allocate critical materials used in the stockpiling program through so-called "entitlements for consumption." The extent of the close relationship between the Defense Production Administration and the International Materials Conference is substantiated by a press release issued by the Defense Production Administration on August 20, 1952, entitled, "Defense Production Administration takes over United States Personnel of the International Materials Conference Secretariat." The Defense Production Administration accepted the allocations made by the International Materials Conference and used the "entitlements for consumption" figures

of the International Materials Conference as a basis for the amount of minerals and metals which were available to the United States for its internal distribution of minerals and metals to meet the needs of industry, defense, and the stockpile. Thus, in effect, the International Materials Conference, an unauthorized group of persons in other countries, dictated to the United States how much of such critical materials could be allocated to the United States stockpile.

DOMESTIC INDUSTRIAL USE CURTAILED

The restrictions which were accepted by the Defense Production Administration effectively curtailed our stockpile acquisitions, and the amount of minerals and metals used in our own domestic industry.

Through allocation orders issued to industry by National Production Authority, allocations for domestic industrial use and for the stockpile were curtailed for many metals and minerals. Since without such allocations or certifications by the Defense Production Administration, the stockpile was unable to purchase strategic metals and minerals and their allocations were in turn thus limited by the International Materials Conference.

DIVERSIONS FROM THE STOCKPILE

The so-called "entitlements for consumption" established by the International Materials Conference created a shortage of critical materials in this country for the benefit of foreign powers particularly in the following materials: cobalt, copper, molybdenum, nickel, sulfur, tungsten, and zinc.

These "entitlements for consumption" were implemented for the State Department through the cooperation of the Defense Production Administration, the Office of Price Stabilization, and the National Production Authority. As a result of these artificial shortages and in order to keep our industries going, it was necessary to withdraw strategic and critical materials from the stockpile and what was equally important to divert to industry delivery of enormous quantities of strategic materials contracted for the stockpile.

INTERNATIONAL CARTEL

The Defense Production Administration and the National Production Authority, when they accepted the "entitlements for consumption" fixed by the International Materials Conference, an international cartel realized that private industry, defense needs, and our stockpile needs could not all be met if we were to comply with the "entitlements for consumption" set by the International Materials Conference.

The International Materials Conference likewise recognized this fact, and in their report specifically stated that in allocating how much the United States could acquire of certain minerals and metals that they made no provision for stockpiling by the United States of certain metals, such as nickel, tungsten, and molybdenum, of which there was a short supply.

Therefore, the National Production Authority and Office of Defense Mobilization instructed the Munitions Board and the General Serv-

ices Administration (Emergency Procurement Service) to divert orders for minerals and metals destined for delivery to the stockpile to private industry, because there was insufficient supply for both the stockpile and private consumption.

By following the International Materials Conference "entitlements for consumption," the Defense Production Administration and the National Production Authority effectively curtailed stockpiling to an extent of $140 million, according to the reports of the Munitions Board of January 23, 1952, and August 15, 1952. These diversions had a twofold effect: (1) It decreased the inventory of our stockpile and delayed its accumulation; (2) since prices have been rising constantly in the last few years, it must be presumed that any subsequent deliveries were at the higher world prices prevailing in 1952 and 1953.

One aspect of the International Materials Conference fixing "entitlements for consumption" to all nations is that since the United States is the producer of over 90 percent of all molybdenum in the world, it must be presumptuous, to say the least, for a de facto organization such as the International Materials Conference, which was overriding the Congress of the United States and the Munitions Board, to fix how much molybdenum the United States could use for its own stockpile. (See hearings, pt. 4, p. 1056.)

In addition to diversions, the stockpile was further decreased because of the artificial shortages caused by the Office of Defense Mobilization-Defense Production Administration acceptance of the "Entitlements for consumption" quotas set by the International Materials Conference which caused the withdrawals of several strategic metals from our stockpile by Presidential order.

ECONOMIC COOPERATION ADMINISTRATION-MUTUAL SECURITY AGENCY ADVANCES CLOSED MINES, WATER FILLED

It has been developed that the Economic Cooperation Administration and Mutual Security Agency have advanced hundreds of millions of dollars to European nations to buy copper, lead, and zinc. For example, England had been given in a 3-year period $124 million to purchase copper, $64 million to purchase zinc, and $34 million to purchase lead. Through this Economic Cooperation Administration and Mutual Security Agency financing, in combination with the "Entitlements for Consumption" plans of the International Materials Conference, foreign nations have bought tremendous quantities of these minerals beyond their needs.

For example, Great Britain acquired so much lead, zinc, and copper that late in 1952, she dumped lead and zinc on the United States markets in such quantities that the market price completely broke and a large number of lead and zinc mines in the United States closed down.

The mining industry claims that this has had an extreme long-range detrimental effect on our potential to produce lead and zinc, since the mines which have been closed will become water-filled, and it will be in some cases almost impossible to reopen the mines due to the high cost of sinking new shafts, acquiring new machinery, and finding manpower.

Domestic ore production although already badly crippled and curtailed through "free trade" competition with the sweatshop labor of

the world would have been continued if these mines were not compelled to close down due to the operations of the International Materials Conference and the dumping by Great Britain. Further examples of foreign buying and favoring of foreign sources for critical materials are evidenced through the closing down of threatened closing down of mercury, antimony, fluorspar, lead, zinc, and other mines.

Witnesses stated that this serves also to further illustrate the fallacy and the danger to the national security of the Paley report theory that we should "save" this Nation's raw materials by leaving them in the ground and thereby discouraging development. Mining operators clearly show that many of these minerals will be left in the ground forever, since in a large number of cases it will be uneconomical and almost impossible to reopen abandoned mines, and in any case impossible to get these materials for use in time of war. This is true particularly where mines have been "high graded" in order to operate as long as possible under the adverse conditions artificially created by Government alphabetical agencies and policies or where prior to abandonment the best ore was taken out in an attempt to salvage capital investment.

HIGHER PRICES PAID FOREIGN PRODUCERS THAN DOMESTIC

There has been a general impression left with the Congress and the public that by buying strategic materials abroad the consumers are getting a lower price.

It is well known that labor costs abroad are much lower than in the United States and the wage gap is from 19 cents an hour in Japan to $1.78 an hour in the United States. The argument that we can get materials cheaper abroad has been urged as a reason for the continuation of free trade in copper, lead, zinc, mercury, and other strategic materials and that by purchasing abroad the consumers in the United States would benefit by lower prices.

Examination of the Government purchases for the stockpile show that in the greater majority of the cases the contracts call for payment of the American market price delivered in New York or at other ports in the United States.

What was even more astounding was the testimony received from the General Services Administration and the Emergency Procurement Service officials in their recent appearance before the committee when they testified that higher prices had been paid in many instances to foreign producers of strategic and critical materials than to domestic suppliers.

Their testimony included facts which indicate that the foreign producers had additional advantages over domestic contractors. Advanced Government financing at favorable rates often not repaid unless a profit was made; supplies; equipment and technical assistance furnished under the various foreign aid programs; unrestricted and unrestrained operations under their contracts without fear of pecuniary action in the event of a contract violation or default; are some of the advantages that accrue to the foreign producer over the domestic operators.

Examples of the prices paid foreign and domestic producers covering commodities purchased at approximately the same time are as follows:

LEAD

	Price
Foreign: Compania Minera de Huehuetenango, February 1951	$0.17342
Domestic: Gibbonsville Mining & Exploration Co., June 1952	.15

ZINC

Foreign: Vulcan Mines Co., Lima, Peru, December 1951	.175
Domestic:	
American Zinc, Lead & Smelting Co., December 1951	.17
American Smelting & Refining Co., March 1952	.155

COPPER

Foreign:	
Falconbridge Nickel Mines, Ltd., Canada, March 1953	.30
International Nickel Co., May 1953	.27
British Metals Corp., December 1952	.30
Granby Consolidated Mining & Power Co., Ltd., March 1953	.30
Domestic:	
American Smelting & Refining Co., November 1951	.245
Anaconda Copper Mining Co., November 1951	.255
Yucca Mining & Milling Co., April 1952	.245
San Manuel Copper Corp., August 1952	[1].24

[1] Future delivery, property not yet operating.

In taking a programwide look at the assistance given foreign and domestic corporations for development and expanding facilities dealing with such minerals as columbite-tantalite, lead-zinc; manganese ore and tungsten we find the assistance adds up as follows:

Analysis of Federal assistance for minerals expansion programs, July 1, 1950, through Mar. 31, 1953

Material	Total foreign assistance, including direct dollar, Export-Import Bank loans, and ECA-MSA	Total domestic assistance, DMPA-DMEA-RFC and public funds, road funds	Excess of foreign over domestic
			Percent
Columbite-tantalum	$28,550,000	$5,862,000	387.00
Lead-zinc	17,211,000	6,668,000	157.00
Manganese ore	100,925,000	92,357,000	9.27
Tungsten	34,693,000	15,595,000	122.50

Total foreign assistance, $594,126,000.
Total domestic assistance, $527,893,000.

PROBABLE ULTIMATE NET COST PROGRAM (PUNC)

A sister program of the stockpile program was that of the Defense Materials Procurement Agency, under the Administrator of the General Services Administration. The Defense Materials Procurement Agency was engaged in a program for the expansion of sources of metals and minerals. One of the programs involved purchases under the probable ultimate net cost program authorized by the Defense Production Act of 1950 (Public Law 774, 81st Cong.), Executive Order 10161 dated September 9, 1950.

This program apparently was designed to make available to industry materials needed for immediate use in defense, and the procurement of

items which were in very short supply and which were also required for stockpiling purposes. These open purchase programs provide for the purchase by the Government of all material tendered to it.

Among the principal purposes of the Defense Production Act of 1950, as amended, is the procurement of critical and strategic minerals and metals.

The act provides for this function by authorizing the President to stimulate expansion of production of such minerals and metals. In carrying out these functions the President is given broad powers such as making advance payments against production, the lending of money to construct facilities, the payment of subsidies, and authority to commit the Government by contract for purchases at prices in excess of market price or anticipated loss on resale of such purchases.

The original act was construed to require that a sufficient amount of borrowing authority must be committed for each transaction to cover the gross disbursements. This was changed by the 1951 amendment to provide that obligations need be covered only to the extent "of the probable ultimate net cost to the United States under such transaction," i. e., under the original act, if the Government agreed to purchase $1 million worth of copper or to make an advance of $1 million, the borrowing authority had to be charged with that amount regardless of the fact that in the first case the copper might be sold at cost or in the second case that the loan might be repayed in full.

Under the amendment the executive agency was allowed to estimate the loss, which would probably be sustained in resale and only charge the borrowing authority with the amount of the anticipated loss. In the case of loans, the executive agency might properly assume that the loan would be repaid and, therefore, no ultimate net cost was involved.

PRESIDENT TRANSFERRED RESPONSIBILITY

Under Executive Orders, the President assigned overall responsibility for the administration of the act to the Office of Defense Mobilization.

Expansion programs were the responsibility of the Defense Minerals Exploration Administration (Department of the Interior), while contracting authority was vested in the General Services Administration.

The Defense Minerals Exploration Administration developed expansion programs, including the recommendation of individual projects, which it submitted to the Defense Production Administration for certification. This certification, together with an allotment of borrowing authority funds, was made by the Defense Production Administration to the General Services Administration.

Defense Minerals Exploration Administration of the Department of Interior was given the responsibillty for the exploration program.

Subsequently, the program responsibility of the Defense Minerals Administration and the contracting authority of the General Services Administration were both placed in a new emergency agency, the Defense Materials Procurement Agency. Under this setup programs were submitted by Defense Materials Procurement Agency to the Defense Production Administration and certified back by the latter to the former.

In addition to the provisions of the Defense Production Act, contractors under the programs were also afforded the benefit of acceler-

ated tax amortization provided by section 124 (a) (g) of the Internal Revenue Act.

Under the Defense Production Act some 38 expansion programs were developed, covering all of the strategic and critical minerals and metals which it appeared would be in short supply in the event of major hostilities.

Some of these programs were accomplished solely by means of tax amortization, as for instance the taconite (iron ore) program in Minnesota. However, in most cases additional inducements were found to be necessary.

THE OPEN PURCHASE PROGRAM

In general, with respect to minerals which were produced by a large number of small operators, the open purchase program method was adopted. Under it regulations were prepared by the General Services Administration which provided that for a certain period of time the Government would purchase and pay for any quantity of materials meeting published specifications which was tendered to it by the producers.

Depots were set up for the receipt of and payment for such materials. Because of the requirement in the original Defense Production Act that borrowing authority be allocated to each project in an amount sufficient to cover gross expenditures, it was necessary to put a quantitative limit on the amount of material which would be purchased by the Government. The amount was designed to cover the maximum anticipated receipt during the period of the program.

Obviously, for this program to be effective and in order to encourage miners to develop new sources of supply and to make the necessary investments therefor, the latter had to be satisfied that the Government would not at a later date withdraw its offer.

Accordingly, miners were invited to give written notice of their intention to participate in the programs and such notices were construed by the General Counsel of the General Services Administration to constitute a firm offer and acceptance, thus preventing the Government from withdrawing or amending the regulations to the detriment of the contractors.

In general, these open purchase programs extended until 1956, but were subsequently further extended an additional 2 years by Public Law 206, approved August 7, 1953, 83d Congress, 1st session.

Programs were initiated for domestic tungsten, manganese, mica, beryl, chrome, asbestos, columbium-tantalum, and also for foreign columbium-tantalum. It is fair to say that all of these programs are successfully meeting their objectives, thus effectively disproving the Harry Dexter White assumption that there are no more mineral reserves.

In the case of materials usually produced by a relatively small number of large operators, individual contracts were entered into by Defense Materials Procurement Agency under delegation to the General Services Administration. These contracts were for direct purchase in whole or in part of the material produced or were floor-price contracts. The latter provided that the contractor would have the option to either sell his production on the market or to tender it to the Government at a fixed price.

The purchase contracts were designed to guarantee the contractor the return of his capital investment plus a reasonable profit. The

amount of the profit was to a large extent determined by the residual value of the property upon the termination of the contract.

If it was estimated that the property would have little or no value at the termination of the contract, the profit allowed was relatively high. On the other hand, if it was deemed probable that the property, having been entirely amortized, by the end of the contract would be fully competitive with other producers, the profit guaranteed by the contract was relatively modest.

The floor price contracts generally provided for minimum prices under the market at the time the contract was entered into, and were designed to protect the contractor from loss due to a sharp decline in prices. They guaranteed no profit other than recovery of the capital invested less the residual value thereof.

The purchase price or the floor price, as the case may be, was arrived at through negotiation between the Government and the contractor. Normally the contractor was invited to present his cost estimates, which were checked by Government engineers. The contracts normally included a provision for escalation both up and down to protect both parties against fluctuation in the purchasing power of the dollar and were based not upon the cost to the contractor but on fluctuations in various published cost indexes.

Examples of programs carried out under floor-price contracts are the aluminum, copper, and zinc programs. Purchase programs are exemplified by molybdenum, nickel, and cryolite.

The contractor (with a floor-price or a purchase contract), was able to finance the development of his property privately, either with his own funds or with funds secured in the open market. In a few cases, because of the magnitude of the operation or because of excessive risks involved, Government financial aid was required. This assistance took the form of either direct advances by Defense Materials Procurement Agency or the General Services Administration or of loans by the Reconstruction Finance Corporation for domestic projects and by the Export-Import Bank for foreign projects. The two largest examples of domestic loans were San Manuel Copper Corp., Arizona, to which the Reconstruction Finance Corporation advanced $94,000,000 and the White Pine Copper Co., which received a Reconstruction Finance Corporation loan of $57,185,000. Only 6 loans were made by the Export-Import Bank, the largest being Rhodesia Congo Border Power Corp. $22,400,000 for copper and cobalt production. The ICOMI, a United States Steel Corp. subsidiary, manganese producer in Brazil, for $15,000,000 and the Campbell Chibougamau Mines, Ltd. a copper producer in Canada for $5,500,000.

Efforts have been made to use V-loans (private bank guaranteed by Government) instead of direct Government advances. This procedure was considered more desirable from the Government's point of view since no public funds were involved, and the private lending institution supervises the loan.

However, the guaranteed loan proved practical only in 2 or 3 cases. The largest transaction of this nature was a Government guarantee of a $75,600,000 loan made to the Reynolds Reduction Co., by a group of large banking and insurance companies to enable that company to participate in the second round of aluminum expansion.

Fundamentally, the procurement of materials under this program is designed to accomplish two objectives.

1. Government stockpiling; and

2. Supplying industry with critical and strategic materials beyond the quantity normally needed for civilian consumption.

The act specifically provides for resale of purchases made by the Government pursuant to the act.

During the height of the Korean hostilities it was necessary for the Government to sell to industry, to meet defense needs, many of the critical materials purchased pursuant to the act. As of June 30, 1953, the Government had acquired minerals and metals pursuant to the act at a cost aggregating $303,307,569.82 and in turn sold $178,359,477.99. The cost to the Government of the materials sold aggregated $200,487,566.85, resulting in a loss of $22,128,088.86 (see exhibit B of the Annual Report of Financial Condition and Operations, June 30, 1953, prepared by GSA).

Purchases made pursuant to the act are carried out through the use of funds borrowed from the Treasury (sec. 304 (b) of the act).

The act authorizes the borrowing of $2,100 million. However, an amendment to the act provides that our obligations shall extend only to the probable ultimate net cost (PUNC) to the Government. In other words, while a gross transaction may involve, say, $1 million, the PUNC may probably represent only $100,000 due to the fact that on resale the major part of the gross transaction will be recovered by the Government.

Exhibit A–6 of the above-referred-to report shows that we are authorized to borrow $951,292,000 for carrying out the functions of this agency under the Defense Production Act. However, we have only obligated $614,141,664.62 for gross transactions aggregating $6,468,507,674.

It may be seen, therefore, that while our gross transactions amount to over $6 billion the ultimate net cost to the Government is estimated at roughly $600 million.

PUNC (probable ultimate net cost) to the Government is an estimated figure which fluctuates from time-to-time due to several factors, among them being changes in market price and uncertainty as to the amount of materials that may be offered to the Government under long-term contracts which extend in some instances to 1963. In the event of a drop in market of a certain commodity, for example, zinc, producers having a floor-price contract with the Government will offer the zinc to the Government rather than industry when the floor price exceeds the market price. This contingency cannot be accurately determined at any one time so long as commitments are outstanding. Accordingly the PUNC (probable ultimate net cost) to the Government figure is periodically revised because of the presence of the factors named above.

The losses to the Government are explained, in part, by the fact that it was necessary to obtain the needed materials quickly due to the national emergency at a price, in many instances, in excess of the prevailing market price, which action is expressly authorized by the act.

While the Office of Price Stabilization price ceilings were in effect, the Government was required to sell at a price not exceeding the Office of Price Stabilization ceiling and thus forced to take a loss on certain sales; or in the event no ceiling existed the Government was obviously compelled to sell at the market price and sustain a loss in order to furnish industry with the requisite supply to meet civilian and defense needs.

INDUSTRY VIEWPOINT ON DOMESTIC STRATEGIC AND CRITICAL MATERIALS

The subcommittee sought the views of producers of strategic materials on the problems of availability, sufficiency of production, and requirements in time of war and peace as well as their views on technological changes in production and research and on the effects of foreign competition on the health and economy of the domestic strategic-materials industry.

Industrial-production experts in the fields of strategic materials including chemicals, tungsten, lead-zinc, potash, mercury, chromite, manganese, uranium, titanium, and other critical materials, appeared before the subcommittee voluntarily at their own expense and often at great personal sacrifice in an effort to assist the subcommittee in a problem so vital to the national interests of the United States. A complete listing of industry representatives appears in the appendix.

Hearings were held during the past several months in various cities on the west coast as well as in Washington, D. C.

The committee concentrated its study on the availability of strategic and critical-material resources within the United States, supplemented by the production of the Western Hemisphere. The subcommittee has limited its study to this hemisphere since the evidence established that in the time of emergency the dependable sources of supply of critical materials rest in the Western Hemisphere.

RELATIVE POSITION OF THE LEAD AND ZINC INDUSTRY IN THE MINING FIELD

The United States has long been and is now the world leader in mine production of lead and zinc. Prior to World War II the United States had never, in any one year, imported more than 100,000 tons of lead or of zinc. Greatly accelerated war demands brought a heavy increase in imports and resulted in strong pressure on domestic producers for maximum production.

DOMESTIC PRODUCTION, FOREIGN IMPORTS, AND DOMESTIC CONSUMPTION

Although short of experienced labor and faced with ore reserves depleted to an extremely low point due to having been forced to "high grade" [1] their mines during the depression years, the domestic industry reached a peak of 496,000 tons of lead and 768,000 tons of zinc in 1942. Production thereafter declined, under the adverse conditions of depleted developed ore, shortage of manpower, and controlled prices, to a low ebb in 1946 of but 335,000 tons of lead and 575,000 tons of zinc.

Throughout the entire period of the depression and the following war years the domestic lead-zinc mines operated under the extreme handicap of financial inability and lack of incentive to invest money to undertake the long-range exploration and development projects necessary to replace the reserves being mined out.

[1] Unable to do necessary development work for reserves.

Thus, 1946, when wartime controls ended, found the domestic lead-zinc mining industry in poor condition with regard to both ore and financial reserves.

Better manpower conditions, improved availability of equipment, and higher prices for metals permitted a gradual improvement and a resurgence of exploration for reserve supplies. Domestic production increased under these more favorable conditions to 430,000 tons of lead in 1950 and 679,000 tons of zinc in 1951, a rapid recovery from the poor showing in 1946.

Excessive imports of lead and zince started flooding the United States market during the recession of 1949 and 1950. The increase in imports of zinc in 1950 was moderate, being only 121 percent of the 1948 total, but lead imports increased substantially to 166 percent of 1948.

The impact of excessive imports from low-wage countries was sufficient to drive prices from a high in early 1952 of 17.5 cents down to 9.25 cents for zinc and from 21.5 cents down to 10.5 cents for lead in 1953.

The Korean war started a worldwide scramble for metals. Prices rose accordingly and imports of lead, particularly, were greatly diminished. Price ceilings were placed on metals in the United States, but world markets were free, with the result that world market prices were much higher than ours.

In the scarcity market created by domestic price controls, domestic allocation controls, and discriminatory international allocation controls (which permitted consuming nations other than the United States to actually hoard lead-zinc-copper in stockpiles) the United States was unable to get the imports needed to supplement our domestic production. Even defense production was hampered by the shortage.

In mid-1952, the foreign stockpiles were up to their target and excessive imports were resumed into the United States market. Other consuming countries stopped buying lead-zinc and diverted their normal imports to our market. They also liquidated in our market a considerable portion of the stockpiles hoarded at our expense, both in dollars and employment while we were short of metals.

Imports of primary lead in 1952 and 1953 were 193 percent and 176 percent of the 1948 rate; 247 and 225 percent of the 1951 rate.

Imports of new zinc in 1952 and 1953 were 158 percent and 208 percent of the 1948 rate; and 145 and 190 percent of the 1951 rate.

Domestic prices dropped from 19.5 cents to 9.25 cents for zinc and from 19 cents to 12.5 cents for lead.

Domestic production under the impact of this 2-year deluge of imports was down, by December of 1953, to but 70 percent of the 1950 rate for both lead and zinc and represented but 70 percent and 63 percent, respectively, of the peak, postwar productive year for those 2 metals, that is, 1950 for lead and 1951 for zinc.

Domestic consumption of new metal serves best for comparison purpose using data on new production and imports of new metal, for the obvious reason that the availability of secondary metal would be the same regardless of whether our new metal is obtained from foreign or domestic sources. Therefore consumption of new metal is used in the following comparisons.

The reduced production of domestic lead-zinc mines is incongruous when compared with domestic consumption for 1952 and 1953. Consumption of both lead and zinc remained at high levels in both

those years, zinc particularly, which reached an all-time high of 977,636 tons in 1953. Domestic mine production for 1953, however, decreased to 335,412 tons of lead, and 534,730 tons of zinc, lower even than the 1946 record.

The subcommittee was concerned with the distressed condition of the lead-zinc industry at a time of high-level consumption of the metals, with a high-level of industrial activity, of stable prices for practically every other commodity in national and international trade. It was concerned—

(1) because of the threat to the industry's ability to survive;

(2) disrupted economies in the producing areas;

(3) the threatened loss of productive capacity in periods of emergency; and

(4) the certainty of the United States being exploited in terms of metal prices if the competitive balance of the domestic industry should be destroyed or materially weakened.

THREAT TO THE INDUSTRY'S ABILITY TO SURVIVE

The excessive import periods of 1949–50 and 1952–53 forced many mine closures and made high grading of the proven ore reserves necessary in others.

Small mines and prospects were the first casualties, for they did not have sufficient finances to permit operation in loss periods or to stand shutdown and maintenance costs. Some of these properties would have normally developed to larger operations, contributing materially to future production. Their closure lowers the promise of future reserves, discourages the actual and the potential investor in the exploration phase of mining. Western lead-zinc mines normally have but a few years of proven minable reserves. It is only through the finding of new reserves through prospecting, small mines, and long-range development projects in established districts that nearly 100 years of productive history has been established. Risk investment in the search for new ore reserves has been practically eliminated by present conditions and therefore such mining as is being continued is done at the expense of ore reserves.

Evidence submitted showed that Utah had 74 producing lead-zinc mines in 1948, before the first excessive import period. The number decreased to 52 in 1950, 30 in 1952, and but 12 for 1953. Production of lead-zinc in Utah was not decreased proportionately, but all the small mines and prospects were closed and those remaining in operation were producing at a loss.

New Mexico's entire lead-zinc mining industry, which produced 50,000 tons of zinc and 14,000 tons of lead was entirely shut down by December 1953.

The major portion of the industry is operating at a loss and each operator is faced with the alternative of shutdown or abandonment if not accorded prompt relief.

Shutdowns with continued maintenance operations of the mines, pending changes of conditions, has serious limitations because of the high cost involved. Two such operations, in Park City, Utah, closed in June 1952, after spending a total of $600,000 in maintenance costs in about a 13-month period. Company finances and stockholders' willingness to bear assessments limit the maintenance period.

One operator was asked to estimate the time and cost factors in reopening his mine, in some future emergency, assuming it to be closed and to have been stripped of capital equipment. He estimated 4½ years and a new investment of $2,750,000 to again become productive and 6½ years and about $4,000,000 to reach present productive levels, i. e., 6,000 tons of lead and 4,000 tons of zinc per year.

Mines must be kept open to retain productive capacity. The operation of small mines and prospecting must be encouraged to afford opportunity to find and develop future reserves. Industry representatives testified that this could be assured under prices reasonably consistent with operating costs in our present economy. Average prices for lead and for zinc for the years 1946 to 1952, inclusive, were 15.7 and 14.25 cents respectively, prices which would, if reasonably assured through tariff protection, serve to stimulate the mining of known reserves and the search for new ore.

DISRUPTED ECONOMIES OF THE PRODUCING AREAS

In January of 1952 there were 25,600 employees in lead and zinc mines and mills. In October of 1953 the number had decreased to 17,400 (Lead-Zinc Report, United States Tariff Commission, April 1954). Nearly one-third of the workers lost their jobs. The communities experiencing the loss in employment are dependent on mining as the basic industry and the actual and potential unemployment is therefore multiplied several fold. The extreme case where the community has no other basic industry, results in ghost towns.

The 11 Western States in 1953 suffered a $112 million loss on the metals they produced as compared to 1951. As there was little or no profit made on the 1953 production that sum represented the actual loss to the communities affected. It was spread through the community through reductions in wages and salaries, profits, and taxes.

THREATENED LOSS OF PRODUCTIVE CAPACITY IN EMERGENCIES

The present plight of the lead-zinc industry, i. e., small mines closed, larger mines operating at a loss and exhausting ore reserves presents a growing threat to production in emergency situations. It took 4 years for the industry to recover after World War II. Four years is not a fair measure, for the upward trend had not reached its peak, but was interrupted by adverse conditions in 1949–50, and 1952–53.

Once closed down, mines take years of time and tremendous sums to reopen. We would be in desperate shape if we suddenly found ourselves in an emergency requiring maximum availability of metals for our industrial plants. With curtailment in capacity, experienced workers and technical staff gone, machinery liquidated, mine openings full of water and partially caved, much of the once available ore reserves lost, small mining and prospecting for new ore reserves is discouraged to the point of nonexistence. The shortages in 1951 illustrate the effect of even a minor shortage. Domestic production in 1953 fell below 1951 production by 100,000 tons of lead and 145,000 tons of zinc.

The argument is often heard that Canada's and Mexico's production of lead and zinc would protect us in emergencies, assuming complete shutoff of all water transported imports.

That is true if domestic production is maintained at a high and healthy level. In 1951 Canada's and Mexico's total combined exportable (their production less their consumption) lead and zinc was 309,000 tons of lead and 468,000 tons of zinc—representing 45.6 and 50.1 percent of the United States consumption of new lead and new zinc in that year.

Mr. Howard I. Young at the American Zinc Institute meetings in April 1954, estimated that only 10 percent of our domestic needs for zinc could be met by domestic producers at a 10-cent zinc price (present 10.25 cents). That leaves us 25 percent short. At that price there would be no search for new ore bodies so our shortage would grow as mining depleted the volume and grade of known reserves.

The United States Tariff Commission Report on Lead and Zinc, issued in April 1954, states that the ratio of net operating profit to net sales in the first half of 1953 (prices of metals and volume of production were higher than in the second half) for lead-zinc mines and mills, before income taxes, was 5.3 percent compared with 23.6 percent in 1950 and 16.8 percent in 1952.

Holmes Alexander, in a syndicated article published in November 1953, commented specifically on the lead-zinc situation and summarized by saying:

> But it would help, I believe, if the American people as well as their President realized that we are disarming in a way that only our enemies could approve.

DANGER OF THE UNITED STATES BEING EXPLOITED IF COMPETITIVE DOMESTIC INDUSTRY IS MATERIALLY WEAKENED

This proposition is obvious and is demonstrated by specific cases.

Mercury was produced by domestic firms in sufficient quantity to completely fill high-level wartime needs in World War II. As of April 1954 it is in short supply with prices up to $220 per 76-pound flask. Domestic producers are loath to again open their mines and enter the market by reason of having been put out of business after the end of World War II through the price manipulations of the Spanish-Italian cartel. At the end of April the quotation for May delivery was $235 to $238 a flask.

Chile exacted a 12 cents per pound premium on copper from the United States during the 1951 shortage; and on a recent sale of 100,000 tons at 30 cents per pound to the United States stockpile only a few weeks ago, took a sales commission of 17 cents per pound. Rubber, quinine, tin, sugar, potash, and numerous other raw materials have been sold to us in the past at exorbitant prices, simply because dependency permitted such practices.

The United States consumer is simply disregarding experience when he assumes that lead and zinc will continue to be available at or near present low prices once the competition of domestic production has been materially weakened. Foreign cartels will make sure that prices will, under such circumstances, inevitably rise higher, probably much higher than the price necessary to keep the domestic industry competitively healthy.

CONDITIONS CONTRIBUTING TO PRESENT DISTRESSED PLIGHT OF THE DOMESTIC LEAD-ZINC INDUSTRY

Generally the adverse conditions fall in two categories:

1. Conditions prevailing in international trade.
2. Conditions in the domestic economy.

The first—conditions prevailing in international trade—includes several subjects, all affecting the domestic lead-zinc producer and the market in which he sells.

COMPARATIVE COMPETITIVE POSITION OF DOMESTIC AND FOREIGN PRODUCER

The United States lead-zinc industry pays the highest base wage and the highest fringe benefits of any similar industry in the world. Such practice is consistent with our standard of living.

The ore being mined is generally lower grade and situated at a greater depth from the surface than in most major foreign operations.

The last 10 to 15 years has seen the greatest increase of foreign lead-zinc productive capacity that the world has yet experienced.

High demand, high prices, extensive financial assistance to foreign exploration and developments by several United States Government agencies have all served to bring this about. The net result has been to bring into operation many new, relatively high grade, near surface operations, minable by up-to-date mechanized methods, through employment of very low paid native labor. To facilitate the maximum extraction from such operations governments have in many cases provided tax advantages, transportation facilities, favorable exchange rates, and other concessions, and subsidies to facilitate export. They have at the same time loudly decried any suggestion of increased duties on United States imports.

The protest against increased duties on United States imports is consistent with the foreign producers' and government's knowledge that ours is the only free market, of any volume, in the world. It is the only market that will accept the metals in times of surplus. Mexico shipped us only 39,400 tons of lead in 1951, a scarcity year, compared with 223,600 tons in 1950 and 201,300 tons in 1952 (excessive import years). This serves to illustrate the problem.

Currency devaluation by all the major lead-zinc producing countries in 1948 and 1949 served to give them all an immediate competitive advantage over United States producers. They capitalized on it in terms of increased exports to the United States. Mexico, in April 1954, again devaluated her currency by 30 percent. In justice to the domestic producer, duties should be raised to the extent of the devaluation.

Proponents of free trade and of the theory of saving our metals by importing them from foreign sources, and of buying at the cheapest possible price overlook the consequences of such a philosophy in terms of the domestic producers' inability to survive in such competition.

The fulfillment of the expressed attitude of State Department officials—that, when a sufficient number of American mines have been wiped out, supply will come into balance with demand and prices will return to higher levels—Will be attained if no basic relief is afforded the domestic industry against competitive conditions beyond its control and beyond its present ability to meet. Fulfillment will be attained almost entirely at the expense of the domestic producer, the related domestic economy, and national defense.

Such attitudes and such results can best be characterized as "penny-wise and pound foolish."

WORLD MARKETS COMPARED WITH DOMESTIC MARKETS UNDER RECIPROCAL TRADE AGREEMENTS

The Trade Agreements Act was passed in 1934. It had no direct bearing on metals until 1939, when by the Canadian agreement the duty on zinc metal was cut from 1.75 cents on zinc metal to 1.25 cents, and on zinc ores from 1.5 to 1.2 cents. When that proposal was being considered Dr. John W. Finch, then Director of the Bureau of Mines, stated:

> I should like to suggest that a reduction in the present tariff on lead and zinc could hardly be considered in the public interest if viewed from the standpoint of national defense.

Duties on lead and zinc have been reduced through numerous trade agreements since that date, to such a low point that the United States Tariff Commission in their Lead-Zinc Report of April 1954, stated (p. 167, hearings, pt. 1):

> The facts in this report show that, under the present tariff status, imports of lead and zinc are restricted only slightly. During the past decade a substantial part of the imports have been exempt from duty. Present rates of duty, therefore, are having only slight effect upon the competitive position of the several factors of the domestic lead and zinc industries.

Tables showing tariffs, price, and protection for lead and for zinc are shown below. The extremely low percentage protection afforded by the present reduced fixed duty rates give emphasis to the above-quoted statement of the Tariff Commission.

Lead: Tariffs, price, and protection

Year	Tariff per pound lead in—		Average New York lead price per pound	Percent protection		Treaty or agreement
	Ores	Metal		Ores	Metal	
	Cents	*Cents*	*Cents*			
1930	1½	2⅛	5.52	27.2	38.5	Act of 1930.
1931	1½	2⅛	4.24	35.4	50.1	Do.
1932	1½	2⅛	3.18	47.2	66.8	Do.
1933	1½	2⅛	3.87	38.8	54.9	Do.
1934	1½	2⅛	3.86	38.9	55.1	Do.
1935	1½	2⅛	4.07	36.9	52.2	Do.
1936	1½	2⅛	4.71	31.8	45.1	Do.
1937	1½	2⅛	6.01	25.0	35.4	Do.
1938	1½	2⅛	4.74	31.7	44.8	Do.
1939	1½	2⅛	5.05	27.7	42.1	Do.
1940	1½	2⅛	5.18	29.0	41.0	Do.
1941	1½	2⅛	5.79	25.9	36.7	Do.
1942	1½	2⅛	6.48	23.1	32.8	Do.
1943, January	¾	1 1/16	6.50	11.5	16.3	Mexican agreement.
1944	¾	1 1/16	6.50	11.5	16.3	Do.
1945	¾	1 1/16	6.50	11.5	16.3	Do.
1946	¾	1 1/16	8.11	9.3	13.1	Do.
1947	¾	1 1/16	14.67	5.1	7.2	Do.
1948, January to June	¾	1 1/16	16.20	4.6	6.6	Do.
1948, July to December	0	0	19.89	0	0	Suspension.
1949, January to June	0	0	17.13	0	0	Do.
1949, July to December	¾	1 1/16	13.60	5.5	7.8	Geneva rates, 1948.
1950	¾	1 1/16	13.30	5.6	8.0	Reinstated.
1951, Jan. 1 to June 5	1½	2⅛	17.00	8.8	12.5	Abrogation of Mexican treaty.
1951, June 6 to Dec. 31	¾	1 1/16	17.75	4.2	7.0	Torquay agreement.
1952, Jan. 1 to Feb. 11	¾	1 1/16	19.00	3.9	5.6	Do.
1952, Feb. 12 [1]	0	0	17.00	0	0	Suspension.[1]
1952, June 26	¾	1 1/16	15.00	5.0	7.1	Reinstated by President.
1953, Oct. 16	¾	1 1/16	13.80	5.6	7.9	Do.

[1] Suspension subject to automatic reinstatement should price fall below 18 cents.

Zinc: Tariffs, price, and protection

Year	Tariff per pound		Average St. Louis price per pound	Percent of protection		Treaty or agreement
	Ores	Metal		Ores	Metal	
	Cents	*Cents*	*Cents*			
1930	1½	1¾	4.556	32.92	38.41	Act of 1930.
1931	1½	1¾	3.640	41.21	48.08	Do.
1932	1½	1¾	2.876	52.16	60.85	Do.
1933	1½	1¾	4.029	37.23	43.44	Do.
1934	1½	1¾	4.158	36.08	42.09	Do.
1935	1½	1¾	4.328	34.66	40.43	Do.
1936	1½	1¾	4.901	30.61	35.70	Do.
1937	1½	1¾	6.519	23.01	26.84	Do.
1938	1½	1¾	4.610	32.54	37.96	Do.
1939	1⅛	1⅜	5.110	23.48	27.40	Canadian agreement.
1940	1⅛	1⅜	6.335	18.94	22.10	Do.
1941	1⅛	1⅜	7.474	16.06	18.73	Do.
1942	1⅛	1⅜	8.250	14.55	16.97	Do.
1943, Jan. 1 to Jan. 30	1⅛	1⅜	8.250	14.55	16.97	Do.
1943, Jan. 31 to Dec. 31	¾	⅞	8.250	9.09	10.61	Mexican agreement.
1944	¾	⅞	8.250	9.09	10.61	Do.
1945	¾	⅞	8.250	9.09	10.61	Do.
1946	¾	⅞	8.726	8.60	10.03	Do.
1947	⅜	⅞	10.500	7.14	8.33	Do.
1948, Jan. 1	⅜	⅞	13.589	5.52	6.44	Geneva agreement.
1949	⅜	⅞	12.144	6.18	7.21	Do.
1950	⅜	⅞	13.866	5.41	6.31	Do.
1951, Jan. 1 to June 5	⅜	⅞	17.500	4.29	5.00	Do.
1951, June 6 to Dec. 31	⅜	7/10	18.357	3.27	3.81	Torquay agreement.
1952, Jan. 1 to Feb. 11	⅜	7/10	19.500	3.08	3.60	Do.
1952, Feb. 12 to July 22 [1]	0	0	17.500	0	0	Suspended.[1]
1952, July 23	⅜	7/10	13.500	4.44	5.19	Reinstated by President.
1953, Oct. 16	⅜	7/10	10.00	6.00	7.00	Do.

[1] Tariff suspended subject to automatic reinstatement should price fall below 18 cents.

The rates of duty were inadequate in 1949–50 to either control excessive imports or to afford protection to the domestic producer. They failed again to present any barrier or to offer any protection in 1952–53.

Unless adequate tariffs on the basis of fair and reasonable competition are established or quotas on metals are imposed the next period of surplus will see the domestic market again flooded with imports far beyond the need to supplement domestic production, to the further detriment of such portion of the industry as survives the present period.

For all practical purposes the United States market is the only one freely open to imports beyond need.

Practically every other country which imports metals controls the volume through licensing, import quotas, multiple exchange rates, and government purchase and sale. A surplus beyond a desired or specified volume is thereby prohibited.

The trade agreements made under the Trade Agreements Act have apparently served only to lower our own duty applications on metals. They have not served to facilitate freer trade among the other nations, for the trend in the postwar years has been toward more trade barriers—not tariffs—but far more effective barriers built into the bilateral, barter type of trade which now predominates. What can't be traded through such deals is shipped to the United States—our markets are open.

TARIFF AND FREE TRADE

This subject is discussed in detail in another portion of this summary of evidence. The committee's attention was called to the fact that the President's Economic Policy Commission (Randall committee) in its report of January 1954, page 44, stated:

> We are fully aware of the arguments for free trade. It is sufficient to say that, in our opinion, free trade is not possible under the conditions facing the United States today.

The minority report of that committee by Representatives Reed and Simpson clearly stated:

> 1. A sound, stable and prosperous domestic economy in the United States is the most vital factor for a sound international trade * * * "
> 2. A sound, strong and solid United States defense structure founded upon a strong industrial base, is a prime prerequisite for peace and security in the world.
> 3. It is the function of the United States Government to take only such action as may be advisable or necessary to provide a proper atmosphere within which the domestic economy, acting through free enterprise principles, can flourish and provide our people with a high standard of living. Unquestionably we cannot live in isolation and a part of that atmosphere can be provided only through the medium of international relations. They are merely a means to an end—namely, the welfare of the citizens of this country. Accordingly foreign economic policy should be considered primarily in its relation to the domestic economy.

Many industry witnesses strongly feel that trade agreements under the Reciprocal Trade Agreements Act have harmed rather than helped the domestic lead-zinc and other raw-material industries as well as domestic consumers and the public; that a tariff designed to give a reasonable and stable price and to permit needed imports would be of general benefit. Certainly fair prices, stability and the long range public interests have not been served by the chaotic international trade patterns permitted to flourish under the guise of reciprocal trade agreements.

ADVERSE CONDITIONS IN THE DOMESTIC ECONOMY

The domestic lead-zinc industry, as well as most of the hard-rock-mineral mining industry is being liquidated through the mining of known reserves without the performance of prospecting, exploration, and long-range development work in sufficient quantity to concurrently replace those reserves.

The industry view is that the incentive to perform those high-risk phases of the mining cycle has been lost. It has been lost partially through chaotic conditions in the metal markets as above discussed and partially through the tax barriers discussed in detail in other portions of this report. Suffice it to say that unless the incentive to search for new ore is restored the mining industry can be properly compared with the merchant who decides to go out of business. He sells the stock on the shelves and closes shop.

CHEMICAL INDUSTRY

The chemical industry performs an extremely important function in meeting our every-day peacetime requirements and it is a key, strategic and essential enterprise for prosecution of an all-out war.

Experts from Dow Chemical and the Monsanto Chemical companies testified before the subcommittee on our degree of independence from

foreign sources for strategic chemicals in time of emergency. Both Messrs. Tyrone Gillespie of Dow and Francis J. Curtis of Monsanto stated that the continued reduction of tariffs would have a serious effect on the domestic chemical industry.

GROWTH OF THE DOMESTIC CHEMICAL INDUSTRY

This Nation had, until the end of World War I, depended upon Germany and England for our chemical requirements. With the advent of World War I Germany became our enemy, England used most of her production for her own needs and the submarines took their toll on that portion of her supply she could spare this country.

The domestic chemical industry of necessity started to grow during and after World War I and by World War II the picture had changed considerably. We had a strong, dependable chemical industrial capacity which played a vital part in winning World War II.

America produces thousands of chemical products, most of which are essential to our war-making capability. A recent security survey conducted by a leading company revealed that of the 800 products manufactured by the company all found their way into some item required by the military.

CURRENT DOMESTIC ECONOMIC POLICY THREATENS CHEMICAL INDUSTRY

They stated at this time the domestic chemical market is considered soft, as compared with that of West Germany, which today is producing 178 percent of the chemicals she produced in 1939 when Hitler began his play for world conquest.

The West German production has increased in part through our efforts under the Marshall plan, the Economic Cooperation Administration, and the Office of European Economic Cooperation. Chemistry is a German specialty field in which the average wage rate does not exceed 50 cents per hour as compared with a wage rate in this country in the neighborhood of $2.50 per hour. With new equipment, processing, and know-how given her by our industry and Government, Germany has become tremendously productive.

REESTABLISH AMERICAN CHEMICAL INDUSTRY ON BANKS OF THE RHINE

In looking for an outlet for her overproduction, Germany naturally was attracted to our mass markets. The German industry, without the burden of defense costs, or antitrust laws, and fair-trade legislation, has a great advantage over our domestic industry which meets those obligations. Historically, American industry has not shied away from fair and reasonable competition. It has taken on all comers in production, merchandising, and in the development of new ideas on a worldwide basis. However, there is one item in which domestic industry cannot compete and that is labor costs.

Every shipload of chemicals produced with cheap labor and imported into this country is a blow to our standard of living and contributes to the softening of our domestic market and, if not soon halted, can be ruinous to a large segment of our chemical industry.

In short, in the words of one of the witnesses, we are reestablishing our chemical industry on the banks of the Rhine, where it originated a hundred years ago, and letting our own know-how and labor go

begging. Can we afford to risk our safety and security on an area within the very shadow of the Russian armies?

POTASH

Testimony taken by the subcommittee brought out the fact that our current economic policy is operating to make America dependent on foreign sources of supply for critical potash needed during an emergency and for normal peacetime expansion.

The wisdom of becoming dependent on sources of supply located in areas which might not be accessible during an emergency is questioned.

STRATEGIC USES FOR POTASH

The chemical and agricultural industries are the principal users of potash. Certain agricultural commodities cannot be produced without potash. About 90 percent of the potash used in the United States goes into the production of fertilizer.

PRODUCTION SOURCES

Potash or the potassium chloride industry is relatively new in the United States. Prior to World War I Germany had a monopoly on potash production, and consequently during that conflict upward of $50 million was expended in an effort to develop a potash mine at Searles Lake, Calif. Through this program 8 plants were erected and only 1 survived. All other plants in this country were abandoned with the return of German potash.

In the early 1920's the Congress appropriated funds to the Geological Survey to conduct an exploration of potash deposits in the United States.

About this same time the Snowden-McSweeney Co., an independent oil group, discovered potash near Carlsbad, N. Mex. The product was the same as that produced in Germany. This discovery turned out to be a huge deposit and the company organized the United States Potash Co., it being the first to produce mineral potash in this country. The mines were opened in 1931 and refinery was completed a year later.

Other companies, including the Potash Co. of America and the International Minerals & Chemical Co., sprang up, and by 1939 these producers were supplying about half of our domestic potash requirements, amounting to 250,000 tons of K_2O annually. The balance was obtained from Europe.

Then with the start of World War II we found ourselves in much the same position as in World War I, lacking sufficient potash to prosecute the war. During the war the industry expanded tremendously with the agricultural requirements growing by leaps and bounds. Potash was placed on the essential commodity list and was allocated.

The potash industry is a going-concern mining enterprise employing upward of 45,000 men with hourly wages averaging $2.458 with a yearly earning average of $5,200. It is an important national asset necessary to the continuance of the high standard of living in this

country and essential from a strategic point of view in the event of another emergency.

POTASH INDUSTRY THREATENED BY FREE IMPORTS FROM IRON-CURTAIN COUNTRIES

Industry representatives in their appearance before the subcommittee let it be known that the country is facing a situation which will result in the potash industry's return to the pre-World War II status. Actually the industry people feel that World War II had the effect of saving the potash industry. At the beginning of this war the industry was suffering from a price war among Spain, France, and Germany, resulting in a loss to American producers.

Since 1930 the potash industry has prospered without benefit of Government loans, subsidies, tariff, or quotas and from this standpoint the domestic production is extremely vulnerable to low-cost imports. As in the cases of so many other items where an equalizer is not present, the domestic potash market is in danger of being taken over by foreign production which may lead to extinction of the industry.

Russia, in the Eastern Zone of Germany, is said to have about 60 percent of the German potash production potential. Much of this Russian production is landing in the southeastern areas of this country at from $7.80 to $9 per ton cheaper than the domestic producers can offer it. If this situation is allowed to continue without some change in policy, much of the potash production in the United States will be closed.

TUNGSTEN

In conducting its study of the accessibility of tungsten as a strategic and critical material in time of war, the subcommittee called in outstanding experts from the tungsten mining and concentrating industry. These witnesses gave their opinions as to what is required to assure continued production in this country and expansion to a point whereby we can become independent of foreign sources of supply, the availability of which would be in doubt in the event of an emergency.

TUNGSTEN USES

Tungsten concentrates are vital for use in high-speed tools, steels, tungsten carbides, jet engines, and armor-piercing shells. It is one of the hardest and most heat resistant of the metals. These unique characteristics mark it as indispensable and of course places it high on the critical list. With high temperature engineering actually in its infancy it is difficult to determine the role yet to be played by this durable metal.

DOMESTIC PRODUCTION PROBLEMS

Domestic tungsten producers always have been faced with sizable price and demand fluctuations. These variable conditions have resulted in the closing of many operations. A mine is not like a manufacturing unit which can be closed down and reopened at will. It is a long-term, expensive operation wherein plans must be made well into the future. To assure continued operation, exploration, and development, work must proceed to determine ore reserves. These

reserves must be kept at a level where continued economic production can be maintained. However, with outlook as it is, based on the threat of continued closings and reopenings, the industry does not find itself in a position to operate in the most economical manner possible, and it sees no incentive for expansion.

PRODUCTION AND CONSUMPTION RECORD ON TUNGSTEN

The following chart sets forth the domestic production and consumption of 60 percent WO_3 tungsten from 1940 until 1952:

Year	Production	Consumption	Percent of consumption produced in United States	Year	Production	Consumption	Percent of consumption produced in United States
1940	5,120	10,500	49	1947	3,180	8,200	38
1941	6,746	17,500	33	1948	4,228	9,300	45
1942	9,433	18,300	52	1949	3,043	5,212	58
1943	12,055	20,300	59	1950	4,244	6,931	61
1944	10,260	20,100	51	1951	6,167	11,989	51
1945	5,662	14,900	38	1952	7,168	9,072	79
1946	4,908	6,800	72				

The increase in production in 1951 and 1952 was due to the domestic tungsten purchase program that pegged the price at $63 per short ton unit for a period of 5 years. This program created the incentive for many new deposits to come into production and many old ones to reopen. In 1949 many of the domestic producers were forced to shut down completely because of low prices and low demand. The years 1945 through 1948 were touch and go, and many operators were forced to close.

Imports of tungsten for 1952 amounted to 17,864 short tons compared to 7,737 in 1951.

Tungsten mining in the United States is operated generally by many relatively small organizations. Few, if any, of the companies employ more than 350 men. It is, however, vital and necessary in our domestic life in peace and indispensable in war.

Industry representatives claim that if a long-range mineral or economic policy was laid down by Congress the tungsten industry could be depended on to expand production to a point where this Nation alone would become self-sufficient in peacetime. Further, our domestic tungsten production could be expanded to more nearly and realistically approach our wartime requirements.

MERCURY

Mercury is a strategic metal that is used chiefly in the manufacture of electrical apparatus, industrial and control instruments, chlorine, caustic soda and agricultural preparations such as fungicides, insecticides, and pesticides.

Naturally with an increase in production of military, communication, and fire-control equipment the strategic demand for mercury increases substantially during emergency periods.

DOMESTIC PRODUCTION AND CONSUMPTION

The committee heard Mr. Sam Williston as the principal representative of the domestic mercury industry.

Immediately prior to World War II the United States was essentially self-sufficient insofar as mercury was concerned. Production in 1937 and 1938 fulfilled 90 percent of our requirements; however, up until this period the mercury mining industry had been aided by an "evener" designed to make up the difference in wages paid domestically as compared with those paid by foreign competitors. This equalizer was equivalent to 25 percent of the United States market price.

Mercury mining, although a relatively small industry, had been able to hold its own in the field of world mercury producers and as such had supplied most domestic requirements for 80 years prior to 1939.

When World War II started the United States was cut off from the Spanish and Italian production. With the assistance of higher prices production increased rapidly, and our domestic producers succeeded in supplying the needs of industry during World War II. In addition 20,000 flasks of mercury were furnished to Russia.

The peak of World War II domestic mercury production was reached in 1943 when 52,000 flasks were produced. During the last 3 months of that year production had increased to a rate of 60,000 flasks per annum.

The annual industrial consumption rate of mercury stabilized at 50,000 flasks per year for the 1946–49 period. During the latter year consumption began to decline and reached a low of 43,000 flasks in 1952.

EFFECT OF LOW-COST FOREIGN MERCURY ON THE AVAILABILITY OF A DEPENDABLE SUPPLY DURING AN EMERGENCY

At the close of the Spanish Rebellion in 1939 the Spanish Almadan mines were placed in operation, and joined with the Italian producers to form a cartel. Immediately upon the outbreak of World War II the Spanish-Italian segment, through the cartel, skyrocketed the price of mercury to $300 a flask, while in America a ceiling price of $191 a flask was placed on the product. The market for mercury produced by the European cartel during World War II was German and Japanese since the source of supply was principally Spanish and Italian.

After the destruction of their market with the fall of the Axis in 1944 the cartel looked in the direction of the United States for an outlet. Their price was dropped from $300 a flask to the "free alongside ship" New York price, or a duty unpaid price of $45 per flask. This low price closed down the Canadian and Mexican production and nearly wiped out our domestic production.

At that time the cartel openly boasted of its intention of taking over the world market by dumping low-price mercury. They adopted a two-price policy wherein the tariffs of the United States were absorbed by the producer. The result of this system was quite effective and by 1950 domestic production had fallen to its lowest level in 100 years. Only one mine of any importance continued to operate in the

United States and it was able to exist only by consuming its remaining reserves without further exploration or development and wearing out its surface plant without adequate maintenance or repair.

RESULT OF SHUT-DOWN OF DOMESTIC OPERATIONS BY INTERNATIONAL CARTEL

With the close-down of Canadian, Mexican, and American production the cartel took over the world mercury market and prices were raised to $200 a flask, with a still further increase to $240 during the Korean conflict. On June 1, 1954 mercury was quoted at $265 a flask. It was shown and demonstrated before the subcommittee that the American consumer does not benefit whenever the domestic producer is "frozen" out of the market.

As a result of the cartel operations and the failure to protect the domestic mercury interests no prospecting or exploration has been conducted for new mercury ore bodies in many years. Therefore in any future war when sources in Spain and Italy are cut off it would take several years of exploration and development before the United States could again produce mercury in quantity.

Mr. Williston stated as an example of the shortsighted policies followed by our Government agencies, the entire stockpile of mercury has been purchased from abroad through Economic Cooperation Administration and Mutual Security Agency operations principally from the Spanish-Italian cartel instead of contracting with domestic producers to explore and develop and produce this mercury within the United States and Western Hemisphere. If this had been done we would have had at least a seed of a "going concern" domestic mercury industry, and it would not have cost the Government or the domestic consumer as much as is now being demanded by the cartel at the present exorbitant prices.

The American producers, testimony shows, only need a legislative policy which would equalize the domestic price difference in wages and taxes here with the chief competitive country to assure a "going concern" industry.

MANGANESE

Manganese is one of the most strategic metals of the United States for without manganese there would be no steel and without steel no modern industry. In relative importance manganese would take its place at the top of the list of critical and strategic minerals.

It is essential to have steel to fight a war and each ton of steel requires 13 to 15 pounds of manganese. With this relative importance of manganese generally known our entire economy and safety continues to depend on overseas shipments, largely from India and Africa. The United States annually imports 94 percent of our requirements.

DOMESTIC MANGANESE DEPOSITS

The United States has within its borders enormous deposits of low-grade manganese as well as vast blast furnace slag dumps containing significant amounts of manganese. The largest low-grade deposits are in Aroostook County, Maine, and Cuyuna Range in Minnesota. Pilot plant work on the Cuyuna iron range manganiferous iron ore and slags is currently underway.

Assuming this research work will be successful under present policies these great resources could not be operated on a fair and reasonable basis in competition with the low wages in Africa and near starvation wages in India.

As a strategic reserve these deposits will have no value after a major war has started unless they are developed for with few exceptions it is impossible to utilize effectively the Nation's undeveloped mineral resources. It is difficult enough to maintain production in operating mines.

CHROMITE

Chromite, a strategic and critical material required for national defense purposes, has three general uses; normally the grade depends on the use to which it will be put.

For metallurgical purposes chromium is invaluable in resistance to corrosion and for maintaining strength under high temperature .

Refractory chromite is chemically neutral and thus can be used in contact with either basic or acid furnace linings. The main uses of chemical grade chromite are for pigments, tanning leather, and plating metals.

USES FOR CHROMITE DEVELOPED

Mr. Fay I. Bristol, president of the Bristol Silica Co., appeared before the subcommittee in behalf of the Oregon Mining Association, which includes the majority of the high-grade chromite miners in the United States.

Mr. Bristol stated that about the turn of the century the use of chromium in the alloy industry was made possible with the development of electric furnaces for production of ferrochrome. From this beginning the use of chrome alloys has expanded rapidly.

DOMESTIC CONSUMPTION OF CHROMITE

By 1914 consumption of chromite in the United States reached 75,000 tons per year, with an increase to more than 150,000 tons per year during World War I. Half of the latter total was supplied by domestic production.

Consumption by 1940 was a half million tons per year. The peak consumption was reached during World War II at 964,000 tons in 1943, and sliding back to 500,000 tons per year following the war. For the first 6 months of 1953, 712,000 tons were used and of that amount of 404,000 tons went into metallurgical use; 230,000 tons for refractory use; and 78,000 tons in chemicals.

DOMESTIC PRODUCTION

During the top production year, 1943, domestic production reached 160,000 tons but by 1950 there was a sharp drop to 504 tons. According to the testimony this reduction in domestic chromite production was due to the opening of vast deposits of the ore in Turkey, South Africa, and the Philippines.

Needless to say mining costs in these overseas areas are much lower than in the United States, with wages ranging from 35 cents to about $1 per day. Industry witnesses advised the subcommittee that most of the chromite produced on the west coast is consumed on the east

coast, via rail haulage, the cost of which is greater than water transportation to the east coast area from any of the overseas producing areas.

INADEQUACY OF THE 1951 BUYING PROGRAM

In August of 1951 the Congress authorized the establishment of a domestic chromite purchasing program of 200,000 tons at $115 per ton.

A purchase station was opened at Grants Pass, Oreg. to handle the ore produced in that area. Within 3 months this station was accepting 1,000 tons of metallurgical grade chromite per week. This amount, although small in comparison to our imports, served to demonstrate what industry could do if given the proper incentive.

In 1953, 27,500 tons was received at the station. One of the purposes of the program was to encourage the smaller mining prospects. Initially production of these mines was limited to 2,000 tons per year. Later the maximum was increased to 5,000 tons per mine per year and still later the limitation was removed entirely. Such limitations, including the 200,000 ton overall production, naturally discouraged the development of the larger operations.

Testimony from some of the larger operators indicated they contemplated producing under the Government purchasing program, but gave up when it appeared certain that their buying quotas would be reached before they could attain full production.

NEED FOR A LONG-RANGE PRODUCTION PROGRAM

Admittedly the purchase program was launched only as a stopgap measure and the testimony revealed that producers are interested in a long-range program on which they can plan for increased chromite production.

Undoubtedly new money is needed for research, development, and exploration to induce private capital to make the investment and it is probably necessary to lay down by legislative action some principle that will assure producers they will not be thrown into unfair competition with a world market wherein production costs are only a small fraction of those in the United States.

It was testified that actually less than 10 percent of the potential chrome-producing areas in the United States have been explored systematically. To continue the search for additional ore it is felt that development of a long-range legislative policy geared to the difference in wages here and abroad would induce the investment of the private capital necessary.

Such necessity is based to a great extent on the well-known fact that transportation of great bulk items such as chromite, from abroad across major oceans during a national emergency would be extremely hazardous, to say nothing of the cost in lives and materials. Such foreign sources are obviously unreliable, which fact points up the necessity for development of a dependable supply at home.

ANTIMONY

Even though considered a minor metal, certainly any discussion of critical and strategic materials must include antimony, if for no

other reason than the fact that our sources of supply are increasingly dependent on foreign production.

Antimony is one of the so-called alloying metals, found for the most part in lead, its function being to harden and strengthen the lead. Its use is essential in the manufacture of storage battery metal, antifriction bearings, pipes, solder, ammunition, and type metals.

In nonmetal products antimony is used predominately in the form of antimony oxide in flameproofing textiles, plastics, coatings, and for fire-retarding paints.

DOMESTIC PRODUCTION

Testimony on the antimony picture was taken last September in Seattle during the appearance before the subcommittee of Mr. James P. Bradley of the Bradley Mining Co. of San Francisco. At one time this company operated an antimony mine at Stibnite, Idaho, but the latter has been shut down since August of 1952, according to Mr. Bradley.

As a matter of fact there has been no domestic production of primary antimony since 1952.

ANTIMONY REQUIREMENTS IN PEACE AND WAR

It was reported that the annual domestic peacetime requirements of primary antimony are approximately 15,000 short tons. Estimates of wartime requirements were put at 30,000 short tons annually, based on peak use in World War II.

FOREIGN SOURCES

Approximately 90 percent of America's peacetime antimony requirements are imported from Western Hemisphere nations. The remaining sources originate outside the Western Hemishpere but fears have been expressed because the outlook for increased production in the Western Hemisphere are unfavorable, with production on a sharply curtailed basis in Bolivia and Mexico.

This situation simply means that our dependence on Europe, Asia, and Africa becomes greater.

OUR STRATEGIC POSITION

According to estimates, our wartime requirements exceed peacetime use in a ratio of 3 to 1, thereby raising our wartime dependence outside the Western Hemisphere from 10 to 75 percent.

Military experts testifying before the subcommittee have made it clear that access to our sources of supply outside the Western Hemisphere would be problematical during an all-out war. During World War II loss of ships carrying vital raw materials was so great that the outcome of the conflict was in grave doubt.

It is hardly necessary to state that many of those testifying before the subcommittee questioned the wisdom of an economic policy that would to a large extent make this country dependent upon sources that might not be available during a war emergency period.

WOOL INDUSTRY

(NOTE.—Wool "growers" and "manufacturers" being considered separately.)

GROWERS

Industrial leaders in the wool growing field recently testified before the subcommittee that without reservation the domestic wool industry could expand production to a point whereby our dependency on wool from sources 8,000 nautical miles away can be lessened substantially.

PRODUCTION AND CONSUMPTION HISTORY OF DOMESTIC INDUSTRY

During the period 1934–38 the United States ranked second in world wool production. By 1952 we had dropped to fifth.

The annual average production of wool in this country in the past 5 years was approximately 122 million pounds, scoured basis. Average annual requirements during the same period was approximately 371 million pounds, hence our dependency on foreign sources for approximately two-thirds of our requirements.

This country accounted for 16.8 percent of the world wool consumption during those years when we ranked second in production and by 1948 our consumption percentage had jumped to 28.5 percent.

Prior to World War II the average annual importation of foreign wool amounted to 20 percent of domestic production and at the opening of that war a strong American industry was ready to produce sufficient apparel wool for the Armed Forces.

Now, 12 years later, after lowering the tariffs under the 1934 Trade Agreements Act, which compounded the damaging effect of other economic factors, foreign wool imports in 1952 rose to 72 percent of domestic consumption in this country and is perhaps the main factor in forcing domestic wool into a Government support program.

DOMESTIC PRODUCTION UNABLE TO COMPETE WITH IMPORTS UNDER PRESENT ECONOMIC POLICY

Competition from low-cost imports has accounted for a decline in domestic sheep raising. For example in 1942 the sheep population was 49,287,000 and by 1952 it had declined to 27,857,000. During these declining wool production years our per capita consumption was increasing. The rate of increase for the 1946–52 period being 54 percent over the 1934–38 period while at the same time world consumption of wool was declining 6 percent per capita.

FOREIGN AND DOMESTIC PRODUCTION COSTS

Official studies conducted by the Department of Agriculture in the United States and Australia during 1948 and 1949 reported comparative production costs as follows:

Cash labor costs in the United States were $2.75 per head as against 52 cents in Australia. Labor for sheepshearing was 44 cents in this country as compared with 12 cents in Australia.

Total cash and noncash costs amounted to $10.41 per head in the United States as against $2.14 per head in Australia. This means that Australia is able to produce 5 sheep while only 1 is being produced in this country.

DOMESTIC WOOL MANUFACTURING

The National Association of Wool Manufacturers testified that 8 million man-hours of labor by United States textile workers would have been required to produce the wool fabrics imported in 1952. The average wage of the American worker at that time was $1.55 to $1.65 an hour while the prevailing rate for the same work in Great Britain was 40 cents per hour.

The domestic wool growing and wool textile industries are closely related, the domestic manufacturer being the grower's only customer.

MANUFACTURERS

The subcommittee hearings brought forth information as to the dire situation faced by the woolen textile manufacturing industry in America, with 140 woolen and/or worsted manufacturing mills having gone out of business since early 1949.

Domestic wool raising and manufacturing is tied in closely since much of the competition of foreign produced wool is imported in fabric.

STRATEGIC IMPORTANCE

Wool experts stated this means a terrific loss to an industry that 10 years ago mustered all of its forces to clothe the military forces of the United States and it allies. A vigorous wool textile industry is vital to our defense. They declared we have in effect surrendered and transferred our wool textile industry to foreign countries, the production equivalent of the 140 mills referred to above now being located within easy striking distance of our potential enemy.

CIRCUMSTANCES CONTRIBUTING TO THE LOSS OF THE WOOLEN INDUSTRY

The curtailment of wool growing in the United States has had the effect of reducing the raw materials available for manufacturing into fabric. While production of woolen products was being curtailed imports of woven woolen and worsted fabrics have mounted. In 1952 the volume of imports reached 24 million square yards, a 30-year record.

The flow into this country of huge amounts of woolen goods is attributable to those responsible for drastically reducing the duties. The assistance offered the wool industry in the past by the imposition of the impost fees was the only media it had to make up the 4 to 1 wage gap differential. Now with the curtailment of this fee industry finds it impossible to compete. Industry spokesmen said that if our domestic economic policy is allowed to remain unchanged the woolen industry will continue to become less active.

RESOLUTION OF NATIONAL WOOLGROWERS, DECEMBER 10, 1953

We wish to reaffirm the historical and traditional position of the National Wool Growers Association that an adequate tariff on wool is the proper way to safeguard the sheep industry of the United States.

The promotion of world trade should be on the basis of fair and reasonable competition and must be done with the principle long maintained that foreign products of underpaid foreign labor shall not be admitted to the country on terms which endanger the living standards of the American working man or the American farmer, or threaten serious injury to a domestic industry.

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The United States Congress is urged to resume its constitutional responsibility of regulating foreign commerce through the adjustment on duties, imposts, and excises through its agent, the Tariff Commission, and allow the 1934 Trade Agreements Act, the so-called Reciprocal Trade Act, which transferred such responsibility to the President, to expire in June of 1954.

NOTE.—When Francis J. Curtis, vice president and director of Monsanto Chemical Co. of St. Louis, Mo., appeared before the committee on March 30, 1954, he warned that the present foreign economic policy of the United States was exporting the domestic chemical industry to the banks of the Rhine. Mr. Curtis stated that—

Currently, there is much discussion of what to do about foreign trade and foreign aid. In this discussion, there is a great tendency on the part of many people to make this Nation's tariffs a whipping boy for the economic problems of our allies. Many persons, interested in curing these problems of our allies, are seriously proposing reductions and removals of American tariffs.

Any tariff changes should be reviewed in the light of the possible effects these changes would have on our national security. I deliberately said "national security" rather than "national defense" because I believe that a strong domestic peacetime economy is as vital to national security as is military defense. * * *

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Curtis warned that—

The German chemical industry should not be ignored. One-third of its prewar chemical industry is now in Russian hands. The other two-thirds—in Western Germany—is now producing at 178 percent of its prewar output, according to the 1952 Annual Industries Report from the United States High Commission for Germany. This same report says that German chemical exports in general for the first 5 months of 1953 were up 26 percent compared to the same period in 1952, and exports to the United States alone were 50 percent greater than the 1952 rate. * * *

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The growing European chemical industries are well organized in marketing their products through cartels. In West Germany, four companies, all of which were part of the I. G. Farbenindustire, control almost the entire organic chemicals production.

In France 2 companies have 95 percent of this field: in the United Kingdom 2 organizations control 85 percent and in Italy 2 companies have 80 percent of the business. * * *

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Methods used by the foreign cartels in the sales of all chemicals include the establishment of exclusive marketing areas, sales below cost were necessary to eliminate competition, sharing of losses among all members and recouping such. * * *

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Is it any wonder, then, that the organic chemicals industry has lost part of the American markets, and, as regards some products, has lost all profit? * * *

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it would have been impossible to establish a chemical industry, unless you had a duty or tariff making up that differential. It would have been impossible to establish, in the first place, and impossible to carry it on now. * * *

With respect to the present unstable domestic economic policy Curtis says—

you can't be sure now, if you are going to invest in a business, just what is likely to happen to you. The rules can be changed. * * *

With the constant reduction of tariffs and the low wages paid by foreigh producers and the competition their products controlled by this international cartel offer to the domestic chemical industry, he says, in connection with this trend—

that the chemical industry can be exported to the banks of the Rhine. There is no reason under God's heaven why you couldn't, and it will be if the going gets tough. * * *

TITANIUM

Titanium is a modern metal for a growing, progressive America. It is a must for modern fighting planes. It is light, strong, durable, and corrosion resistant, these qualities make its development highly important. The raw ores are plentiful in this Nation, Canada, and Mexico. The need for this light and strong material in civilian industry could result in a 5- to 10-billion-dollar civilian industry within 10 years.

Because of these characteristics titanium has been called a "must" for superior air power in the future. Aircraft builders have testified that when titanium is designed into a plane it will result in a saving of more than 8 pounds in the airframe for each pound of weight saved by substituting titanium for stainless steel.

WEIGHT SAVING FEATURE OF TITANIUM

In this connection Maj. Gen. Kern D. Metzger, Chief, Production Resources Division, Air Materiel Command, testified that 1 pound of weight reduction in the engine could result in a 6- to 10-pound reduction in the weight of the airframe. With 8 engines a saving of 500 pounds in each, results in a reduction of 4,000 pounds and makes possible 32,000 to 40,000 pounds total reduction in the plane. Such a weight saving will give our planes a tremendous advantage in extra-load capacity and greater range, speed, and maneuverability.

The first Government contract for the production of commercial titanium was let in 1950. Progress has been slow—too slow.

QUANTITY REQUIREMENTS

Testimony shows that we need a minimum of 150,000 tons per year for the manufacture of military planes alone—we are producing approximately 2,000 tons—two-thirds of that amount in the State of Nevada at Henderson and the remaining one-third in duPont's New Jersey plant.

However, additional contracts have been let since this committee started hearings in 1953 and others are under consideration.

Testimony disclosed that 25 to 40 percent of military airframes should be made up of titanium for long ranges and supersonic speeds—and that if our potential enemy has it and we do not then we have a "second best" Air Force.

The weight-strength ratio of the metal at moderate temperatures is greater than that of any other metal now in use and in addition it is noncorrosive even under sea water and has greater heat resistant qualities than other light metals.

Titanium is just beginning to find itself in a competitive world hungry for new ideas and developments in structural designs in the air and on the sea—and in the making of daily-use equipment for Mr. and Mrs. America will create a new industry.

Titanium is little known to the average American but science has determined that despite its cost at the present time this metal is neces-

sary to modern living and its usage will grow, especially when decreased cost (present price is $5 per pound for titanium sponge) makes it available to other than defense needs, for which the entire allocation to date has been made.

There are many metallurgical wrinkles to iron out, but there is no reason to believe that American ingenuity cannot meet the challenge as it has whenever called upon at any time in the past.

RUSSIAN INTEREST IN TITANIUM

In a troubled world it is disquieting to know that titanium is not just for America only. A check on the bibliography on titanium shows that Russia since 1934 has shown a deep interest in the metal as evidenced by some 257 articles written by Russian metallurgists and scientists.

In an effort to get to the bottom of the titanium story the subcommittee held extensive hearings in late 1953 and early 1954 in Los Angeles, Calif., Henderson, Nev., and Washington, D. C., securing testimony from officials of the Department of Defense, scientists, researchers, producers, and the leading airframe and engine manufacturers.

This summary will review the progress thus far, the many problems to be met to make titanium production a "going concern" industry, and offer recommendations which it is hoped will put titanium on the metal map, in return for the $22,500,000 the Federal Government paid out for raw titanium last year.

WHAT IS THIS METAL?

Titanium is a silver grey metal weighing 0.16 pounds per cubic inch. It is 60 percent heavier than aluminum and 56 percent lighter than alloy steel. Its alloys are far superior in strength-weight ratio to all usual engineering metals and alloys.

The metal promises a possible application potential equal to that of stainless steel and perhaps rivaling that of some of the lighter metals. Its corrosion-resistance is equal to platinum and greater than that of nickel, stainless steel, and the cupro-nickel alloys in sea water and other corrosive fluids. On an equal-strength basis, titanium weight is less than that of aluminum or magnesium. Titanium has a relatively low electrical conductivity and is nonmagnetic.

TITANIUM'S HISTORY

Titanium was first discovered in 1791 by an English clergyman and amateur chemist, William Gregor, who found that the black, magnetic sands of Cornwall contained 50 percent of an unknown white metallic oxide. This later was confirmed by an Austrian named Klaproth, who was successful in extracting the metal from the ore rutile, at which time it was named "titanium," from the mythical Titans—sons of Earth.

KROLL PROCESS

The metal as we know it today was first processed and patented by Dr. William J. Kroll, a 64-year-old scientist from Luxembourg who now resides in Corvallis, Oreg.

In 1928, while looking for a substitute for beryllium for copper-beryllium alloys, Dr. Kroll examined titanium and by using the so-called Hunter bomb process had made metallic titanium and alloyed it with pure copper. While the alloy had good age-hardening properties its lower electrical conductivity eliminated its use. Dr. Kroll sent samples of his metal to Kapiza, an Englishman of Russian descent who is said to be Russia's main atomic bomb expert, but interest was lacking.

Dr. Kroll received a similar rebuff in 1932 when he came to the United States armed with rolled titanium sheet which he had produced from round Hunter pellets. Neither did either one of America's leading smelting and refining companies or one of the largest telephone networks show any interest.

It was not until 1937 that Dr. Kroll invented the process which bears his name, while he was a consultant for Siemens & Halske, a German metals firm. In 1938 Dr. Kroll successfully arc melted titanium with a tungsten electrode and, later that year, with his samples, returned to the United States to sell his ideas to American industry. Response was lacking, as it was in 1940 when Dr. Kroll gave his first paper on the metal before the Electrochemical Society. In 1945 Dr. Kroll joined forces with the Bureau of Mines at Albany, Oreg., where he first began to get into the limelight.

In 1950, for the first time, titanium metal was offered on the open market in various forms such as plates, bar, forgings, tubing, and wire. However, producers of titanium sponge, ingot, and finished products were not able to keep up with the heavy demands for strategic and experimental application.

TITANIUM ORES

Titanium is found in a combined state in various ores making up one-sixteenth of the earth's crust. The main titanium-bearing ores are: 1. Rutile, a high-grade titanium oxide with very few impurities; and 2. Ilmenite, a lower-grade combination of titanium oxide which is more common than rutile.

AVAILABILITY

As stated previously, titanium is plentiful. It ranks as the fourth most abundant structural metal in the earth's crust. Only aluminum, iron, and magnesium are present in greater percentages.

Titanium ores are found extensively throughout the United States, Canada, India, Australia, Norway, Ceylon, Brazil, Sweden, and the Union of Soviet Socialist Republics. Large ilmenite deposits of titaniferous iron ores occur in New York, Minnesota, Rhode Island, Wyoming, California, and New Mexico. Other deposits of iron ores rich in titanium have been reported in North Carolina, South Carolina, Tennessee, New Jersey, Colorado, Montana, and Oklahoma.

RUTILE

Rutile is found in beach sands at many places along the Atlantic, Pacific, and Gulf coasts. They have been worked mainly in Florida and to some extent in Oregon. Rutile deposits also occur in Virginia and Arkansas.

ILMENITE

The Bureau of Mines estimates that at Allard Lake in Eastern Quebec there are 300 million tons of ilmenite containing titanium oxide. It is estimated that 25 million tons of titanium metal can be produced from this source alone.

Despite the availability of titanium-bearing ores, the record readily shows that such availability is potential until the ores are within the grasp of the titanium developers and users.

For instance, Mr. Roy T. Hurley, chairman of the board, Curtiss-Wright Corp., advised the subcommittee that his firm has not done more with the metal because of their inability to get what they consider a continuing source of supply. He stated further that it has been said that Japan has a surplus of titanium sponge for sale and if this be true he wonders why we do not have more of it.

(NOTE.—Japan is the big titanium producer outside of the United States. Japanese titanium sponge production for the fiscal year starting April 1, 1953, is estimated at 160 metric tons. It is of interest to note that Japanese titanium manufacturers are petitioning the United States to exempt or lower the import tariff on titanium, according to a Reuters dispatch from Tokyo early last February.)

Imports of ilmenite concentrates for the first 9 months of 1953 were 209,000 short tons, an increase of 40,000 over the same period of 1952. India supplied 137,000 tons, and Canada 72,000 tons. Imports of rutile concentrates from Australia were reported at 13,000 tons for the same period. Mr. Alexander Shackman, director of North Coast Beach Minerals of Sidney, Australia, testified that it would take Australia, at its present production rate, 20 to 25 years to fill American requirements.

In testifying before the subcommittee in Washington on November 27, 1953, Secretary of the Air Force Harold E. Talbott said that to the best of our ability we should try to secure our raw materials from within our own Nation or adjacent nations in the Western Hemisphere. He stated further:

> We should have our own production and protect ourselves here in this country. Where we have an ample supply of raw material, I see no reason for bringing raw material from other countries.

Mr. E. R. Rowley, president of Titanium Metals Corp. of America, whose coowner, National Lead Co., is one of the world's largest users of titanium, advised that Australia was his company's present source of rutile but that they were mining ilmenite in New York State in in the Adirondacks and securing some from the beach sands in Florida.

He said, further, however, that it was his understanding that there is sufficient ilmenite in the Western Hemisphere to take care of any titanium metal industry with a lot left over to take care of the titanium pigment industry, and probably enough for both. He added that it was the aim of his company to assure themselves an economic Western Hemisphere source of supply, furthermore, that he did not believe it wise to become dependent on foreign nations for critical materials.

Despite the fact that rutile is not as prevalent as some of the other titanium-bearing ores, it has been preferred by his firm, according to Mr. Rowley, because it is an easier starting material and it was

planned to start with such and work back to other materials as some of the problems, cost being one of the most important, were solved.

On this feature, General Metzger stated that he did not feel that costwise or technically titanium will differ from the history of any other material, in pointing out that in 1920, for instance, magnesium ingot was selling for $5 per pound and aluminum dropped from $545 to 19 cents per pound in a period of 100 years, with a phenomenal reduction in the past 15 years.

Most significant was the announcement by Dr. Arthur Flemming, Director of the Office of Defense Mobilization, in testifying before the subcommittee on February 1 of this year, when he stated that a decision to appoint a special committee in Office of Defense Mobilization to sift all available evidence on the titanium problem, had been made.

Dr. Flemming promised that once a decision on a program and on a timetable has been made on the basis of the recommendations of that committee the Office of Defense Mobilization, acting for the President, would see to it that all concerned adhere to the program on the timetable.

THE TITANIUM COMMITTEE

Dr. Herbert H. Kellogg of the Columbia University School of Engineering, was being named chairman of the committee, by Dr. Flemming and serving with him are Assistant Secretary of the Interior Felix E. Wormser and Albert J. Phillips, director of research, American Smelting & Refining Co. Dr. Flemming said he hoped to secure the services of General Metzger [1] and others in the Department of Defense on a consultant basis.

Already in operation at the time of the hearings was the titanium committee of the Headquarters Air Materiel Command, consisting of representatives from the Aircraft Production and Resources Agency, Air Research and Development Command, Air Materiel Command and other interested segments of the Department of Defense. This committee undertakes to assure the following Air Force actions: (1) Coordinate Air Force activities regarding titanium; (2) recommend actions to encourage maximum efficient utilization in aircraft production programs, and (3) serve as a focal point for collection and dissemination of technical information to industry.

Prior to the hearings the Department of Defense recognized the need for a high level policy committee in the Department dealing with problems relating to procurement, development, financing and use of titanium in military equipment, thereby allowing the budgeting, procuring and production organizations of all three military departments to move freely and rapidly into the adoption of titanium as a standard production material.

DEFENSE DEMAND

Secretary Talbott was quite definite in stating that in any future warplanes development titanium is a "must," but even at the present time it would be of great value to us and recommended that we must "move forward on the titanium production with all vigor" and get real production quantities. The Secretary agreed that if a potential

[1] The services of General Metzger have been offered by Secretary Talbott.

enemy had this material available for the manufacture of their aircraft, and we did not have it, we would have a second-best air force.

It was the consensus of testimony that the immediate requirement for titanium, if it were available, would be a minimum of 150,000 tons per year and up to 500,000 tons if we went into a wartime mobilization plan for the production of planes.

Mr. John H. Garrett, Executive Director, Metals Committee, Office of the Assistant Secretary of Defense for Research and Development, explained that his Committee's Board, in a memorandum dated August 7, 1952 to the Departments of the Army, Navy and Air Force, stated that "It is recommended that the Department of Defense take action to utilize all available titanium in applications where military advantages are dominant."

FAILURE OF ADMINISTRATIVE AGGENCIES TO ACT AGRESSIVELY AND MEET PRODUCTION GOALS

According to the information received by the subcommittee the Defense Department, in 1952, set a production goal of 35,000 tons per year by 1956. This was cut first to 20,000, revised to 25,000 by the Munitions Board, and Office of Defense Mobilization. The General Services Administration (the agency charged with letting contracts) had, up until the opening of these hearings, let contracts for the production of only 13,000 tons per year with production actually proceeding at a rate of only approximately 2,000 tons per year.

In this connection Mr. Garrett informed the subcommittee that in a memorandum dated July 28, 1952, to the Chairman of the Munitions Board, his Committee's Board stated that inasmuch as the military requirements 3 years hence for titanium sponge, at present cost, have been determined by the Department of Defense to be 35,000 tons per year, it is recommended that the appropriate government agencies take action to make a capacity of 35,000 tons per year available within 3 years.

Mr. Carl Rolle, Assistant Staff Director for Production and Schedule, Office of the Assistant Secretary of Defense (Supply and Logistics) said that the 35,000-ton goal was based on recommendations of Defense Department agencies as follows: A 27,600-ton schedule for combined Air Force and Navy of which 3,000 tons were for the Navy; 800 tons for the Army, making a total of 28,400 tons; with a 25-percent markup of the 28,400-ton figure. This makes the total of 35,000 tons, the thinking being that if the material were available over and above military needs, there certainly would be counterpart civilian uses, according to Mr. Rolle.

COMMITTEE'S REEXAMINATION OF REQUIREMENTS

The latter explained that with the change in administration in January, 1953 all materials expansion programs were frozen for reexamination, then in August titanium was recertified at 25,000 tons and later was raised to 28,000 tons. Mr. Rolle pointed out that expansion programs are certified by the Office of Defense Mobilization and the latter in turn certifies to the General Services Administration for finding producers and the working out of contracts, which are returned to Office of Defense Mobilization for final approval.

According to Mr. Rolle his committee was to cooperate with the Air Force in bringing about a new survey of needs and which it was thought would result in a revised figure. He said that if it were possible to substantiate a demand in excess of 35,000 tons they would do so.

However, the subcommittee received more heartening information at a subsequent hearing conducted on April 7, 1954, when officials of the General Services Administration reported that Dr. Flemming had advised them to "go ahead and negotiate the contracts that we have in the mill," thereby revising upward to 32,000 tons per year capacity from the 25,000 tons previously reported.

This was later confirmed by Dr. Flemming himself, who explained that General Services Administration had just reached the final negotiation stage on 3 new contracts with an aggregate capacity of 19,000 tons per year, this of course, in addition to the 13,000 tons that were under contract at that time. The three new contracts, recommended by the Titanium Advisory Committee, had just been submitted to the Office of Defense Mobilization for consideration.

PRODUCTION STEPUP

At this hearing the subcommittee also heard Dr. Herbert H. Kellogg of Columbia University, Chairman of the Titanium Advisory Committee of the Office of Defense Mobilization. Dr. Kellogg explained that the stepped-up production plans referred to in the two paragraphs above, meant an increase in the amount of titanium sponge to be produced during the current year from 2,000 to 5,075 tons.

Further encouragement was given by Dr. Flemming, who quoted from the Titanium Advisory Committee, in part as follows:

> In order to permit the most rapid growth of this new industry, it should be the policy of the Office of Defense Mobilization to keep the capacity for titanium sponge production always one step ahead of the estimated rate of consumption. In commenting on this policy Dr. Kellogg declared "that we are in support of a policy which will keep production one step ahead of foreseeable demand, and also in support of a policy which will create a moderately large inventory of titanium available so that sudden spurts in demand can be taken into account.

Of special interest was Dr. Flemming's announcement that the Office of Defense Mobilization intended to establish an interim stockpile of titanium sponge if there is any surplus in current production which would either be withdrawn to take care of military and civilian requirements, or ultimately be held in the stockpile. Dr. Flemming said that in setting stockpile objectives foreign sources of supply would be discounted in accordance with a recent Presidential directive.

While the Air Force undoubtedly will have first preference on titanium demands for some little time to come, other branches of the Defense Department have expressed a very definite interest.

ORDNANCE SAVINGS THROUGH USE OF TITANIUM

Col. Benjamin S. Mesick, commanding officer, Watertown Arsenal, Mass., advised the subcommittee that Ordnance officers recognized from the first, titanium's great potential value to their type of equipment. He explained that a medium tank in steel weighs 28 tons, but if made of titanium alloy it would weigh somewhat less than 20 tons, which he said would be a tremendous advantage. One of their first

applications, Colonel Mesick stated, was the 81 millimeter mortar base plate, in which they were able to reduce the weight from 50 to 22½ pounds. Other applications were made to the grenade launcher, bayonet, entrenchment tools and the helmet, and as Colonel Mesick pointed out, "a few ounces here and there add up."

Colonel Mesick said a second priority for titanium is combat weapons, both artillery and automotive vehicles, so thay can be air transported, and that when sufficient amounts of the metal are available it is expected they will go into the third priority category, consisting of very heavy artillery, tanks and other similar equipment.

The colonel estimated that if plenty of titanium were available Ordnance could use approximately a million tons a year.

TITANIUM TO DISPLACE OTHER METALS

Then the subcommittee heard from Mr. Nathan E. Promisel of the Bureau of Aeronautics, and Mr. Julius J. Harwood, Chief of the Metallurgy Branch, Office of Research, United States Navy. Mr. Promisel stated that titanium would, with more efficiency, replace other materials "to a great extent," perhaps as much as 30 to 40 percent in aircraft. Mr. Promisel spoke highly of the anticorrosive power of titanium.

Mr. Harwood said the Bureau of Ships had had an active prototype-evaluation program in testing titanium and its alloys, evaluating it for meter discs and in all tests it had outstanding resistance to corrosion. Mr. Harwood went on to list many other applications for which titanium had been evaluated. He did make one reservation, explaining that until titanium was available at a price not more than twice that of other similar materials, it could not be used in competition with these other materials. He estimated that under such a reduced cost 1,000 to 1,500 tons per year might be used in current shipbuilding and maintenance. Should the price go as low as $1 per pound they could use 5,000 tons per year, based on wartime-production schedules.

PROCESSING AND RESEARCH

The advent of atomic energy resulted in demands for pure zirconium metal. The methods of zirconium production developed by Dr. Kroll while at the Bureau of Mines at Albany, Oreg., were accepted and have since been used in the production of titanium.

In no way does it detract from the efforts of Dr. Kroll to state that volume titanium processing as we know it today is largely due to the tenacious efforts of Dr. Frank S. Wartman, engineer in charge of the titanium-research section with the Bureau of Mines at Boulder City, Nev.

Dr. Wartman, a 55-year-old native of Phoenix, Ariz., is credited with advancing the Kroll titanium pilot development into a workable industrial process, which is said to have led the Interior Department to predict that the titanium industry would reach a billion dollars a year within the next few years.

Using the Kroll process, because it seemed nearer the production stage than any other, Dr. Wartman and his associates produced 12 grams of titanium on the first run in 1942. With improvements from time to time Dr. Wartman finally was able to secure a production of

500 pounds experimentally by 1952 and in that year the Bureau designed a new pilot plant having a capacity of 1,200 pounds per day. The quality of the metal produced in this plant is the highest obtainable.

ELIMINATION OF SPONGE FORM

In testifying at Henderson last September Mr. Rex R. Lloyd, Director of the Bureau of Mines at Boulder City, stated that his researchers are trying to improve the Kroll process, and develop an electrolytic system which it is hoped may produce a metal without going through the sponge form.

Dr. Wartman advised the subcommittee that as far as converting the Kroll process into a continuous operation is concerned, researchers have about given up hope as their work has shown that it is fundamentally a batch process.

It might be said here that much effort is being expended by industry as in Government to develop an efficient method of titanium sponge production by a continuous line operation. Thus far about 99 percent of the commercial titanium production is based on the modified Kroll process developed by the Bureau of Mines.

Dr. Wartman stated that researchers are disappointed in the progress they have made thus far, saying further, "I think the commercial companies are disappointed in the progress that has been made in eliminating impurities and the variation of the metal in the Kroll process. Some of the basic reasons we do not know. Some of them can be ironed out by larger operations."

PROGRESS OF VARIOUS COMMERCIAL COMPANIES

The Kroll process for major production of titanium was recognized by the Defense Department in the beginning as not the final process that ultimately would be used. However, Mr. Garrett stated that in spite of such recognition, initial expansion using the Kroll process was recommended because the Department was satisfied that they had to have titanium in their equipment.

Despite disappointments and setbacks industry is sufficiently interested and has enough confidence in titanium to keep up a continuing research program. Dr. Edwin A. Gee of the du Pont Co. testified that his company has spent more than $4 million for titanium research, and it is continuing at the rate of $1 million a year; and C. I. Bradford, vice president of Rem-Cru Titanium, Inc., stated that his company had spent $3,500,000, its titanium investigations having been initiated in 1947.

Dr. Augustus B. Kinzel, vice president of the electrometallurgical division, Union Carbide & Chemical Co., said that his organization had continued titanium process research after Dr. Kroll left the company in 1945 and had taken an interest in other processes, some of which the company had taken options on. He stated further that dozens of processes are feasible but to be practicable must be engineered in such a way as to insure a consistently uniform product of high quality. Mr. E. E. Wyatt, executive assistant to the president, Crane Co., informed the subcommittee that Crane had engaged for several years in laboratory and pilot plant work and for 2½ years had been operating a pilot plant in Chicago.

THE INDUSTRY

Industry at this time is spending millions of dollars a year on all phases of titanium research, development, and production. Naturally these millions are being spent now so that in some time in the future America will be able to secure the benefits of this wonder metal at a reasonable cost.

As in the case of aluminum and magnesium, which 60 years ago cost $50 a pound, it is expected that titanium will come within reach of the ordinary commercial uses. As has been testified titanium in the sponge form sells at a market price of $5 per pound. In mill product form the price is about $20 per pound. In other words, the cost of processing from sponge to sheet is about $15 per pound.

In hearings at Henderson, Director Lloyd of the Bureau of Mines testified that the selling price of titanium sponge would probably drop to $3 per pound within the next few years under variations of the Kroll process but to get below that price definite changes must be made.

Production of titanium sponge in 1951 was about 500 tons, from plants operated by Du Pont, Titanium Metals Corporation of America, and Crane Co. of Chicago. The plant of Titanium Metals Corp. is the former Basic Magnesium, Inc., plant at Henderson, built by the Government during World War II. As of last year the Henderson plant was the only fully integrated titanium plant with facilities for chlorination of titanium slag and recovery of magnesium and chlorine.

As of February 1 of this year, there were 2 producers in the United States, Titanium Metals Corp., producing less than 4 tons per day under a 10-ton contract, and du Pont, producing about 2½ tons a day—this as opposed to the testimony of 4 of the largest airplane manufacturers that they could use 350,000 tons annually, with a minimum demand of 150,000 tons.

AIRCRAFT PRODUCERS ESTIMATES ON REQUIREMENTS

In an effort to determine present and future plans of titanium producers and airplane manufacturers it might be well to briefly review some of the testimony as received from officials of these companies.

Mr. Rollin P. Smith, plant manager, Titanium Corp. of America, stated his company had contracted to build and operate a plant capable of producing 3,600 tons of sponge per year. Their goal for the last quarter of 1953 was 400 tons and it was expected that on full completion of their plant they will have a capacity of 900 tons per quarter.

The vice president and general manager of Mallory-Sharon Titanium Corp., Mr. F. H. Vandenburg, told the subcommittee that his company feels that the future titanium picture is practically unlimited, that when the price goes down to $3 or $4 a pound the industry could be as large as the stainless steel industry is today.

President J. L. Holloway of the Crane Co. advised that their subsidiary, Cramet, Inc., had contracted with the Government to produce 6,000 tons of titanium sponge per year in the plant at Chattanooga. It was thought this plant would reach capacity within 20 months of the date of Mr. Holloway's testimony, November 4, 1953 and had been so laid out that it could easily triple or quadruple its capacity.

Dr. Gee (du Pont) stated that his company had a contract entered into in July of 1952 in which they were expanding their operations from 2½ tons per day to a capacity of 10 tons per day. Dr. Gee explained that his company was securing its raw material from deposits at Trail Ridge, Fla., and that they were self-sufficient regarding both metal and pigment production. He stated further that the uncertainty of imports led them to open another deposit in Florida last year and they were at that time producing about 100,000 tons of raw material per year, and expected to double that figure.

Titanium will be used in increasingly large amounts, according to Mr. Norman L. Mochel of Westinghouse Electric Corp., who said they expected to use 41 tons of bar, billet, and sheet, requiring 58 tons of sponge per month in the first half of this year and beginning in July expect to use 55 tons of bar, billet, and sheet, requiring 90 tons of sponge per month. Mr. Mochel voiced the opinion that in the electrical field titanium will find a place, more specifically in the steam-turbine and gas-turbine fields (for purposes other than aviation).

Mr. Edgar F. Nason, general sales manager, Elastic Stop Nut Corp., testified that his company had begun to develop self-locking nuts from titanium at the request of the aircraft companies. He pointed out that the requirements on a fighter plane are about 1,400 nuts, which would save 150 pounds per airplane, not including the engine. The requirements indicated would mean that Elastic would need about 1.5 tons of titanium alloy a month.

Mr. Donald Douglas, president of Douglas Aircraft Co., said that despite the cost of titanium they are using it in their new transport, the DC–7, and making it pay. He stated further that by 1957 they expected more than 20 percent of the structural weight of the airplane would be titanium. It is expected Douglas will use about 13 tons of titanium this year and approximately 22 tons in 1955.

Mr. Tom Lanphier, vice president, Consolidated Vultee advised that under their existing contracts his company was using 55,000 pounds of titanium in 1953 and was expected to use about 130,000 pounds this year and 141,000 pounds in 1955. He explained that the preceding figures were under firm contracts but that planning figures for the extension of these programs are: For 1955 about 773,000 pounds and in 1956, some 2 million plus pounds, or a thousand tons.

COSTS AND ITS EFFECT ON SUBSTITUTION

In pointing out that the present cost of titanium has held his company's use of titanium down to 0.03 percent of empty airplane weight, Mr. Robert Gross of Lockheed Aircraft Corp. estimated that if the cost of semifabricated materials were reduced to $12 per pound, the percentage would rise to 4.5 percent, replacing about 75 percent of the stainless steel used, and at $2 a pound the use of titanium would rise to some 21 percent of the airframe weight. Continuing Mr. Gross said that if titanium alloys were reduced to 40 cents per pound (competitive with aluminum) it would be used for 40 percent of the airframe weight.

Mr. J. Lee Atwood, president of North American Aviation Corp., advised the subcommittee that in their F–86 about 1 percent of the weight is in titanium and 2 percent is in titanium in the F–86H. The

F–100, which they were just beginning to produce, was about 5 percent titanium.

In the program as outlined in the paragraph above Mr. Atwood said the titanium sheet used would amount to 250,000 to 300,000 pounds. This year their contracts call for 830,000 pounds of titanium sheet, pure and alloy and in 1955 their requirements are for 790,000 pounds, and this may well increase.

Mr. L. M. Hitchcock of Boeing Aircraft stated that his company was not using much titanium as of last year but that they have great hopes for the metal and anticipate using considerably larger amounts in the next few years. As a matter of fact Mr. Hitchcock said his company probably would require 7,000 tons of sponge in 1956.

PROJECTED AIRCRAFT REQUIREMENTS

Of interest were some figures submitted by Mr. Hitchcock, based on a wartime production such as in 1944 when the aircraft industry turned out a billion pounds of airframe weight. If this were to be repeated about 200,000 tons of sponge would be required, say, in 1956. If the same production were to be sought in 1959 or 1960, perhaps 400,000 tons of sponge might be used, this increase in sponge use depending of course on a much larger production of airframe weight of supersonic variety (which calls for considerably more sponge) in the 1,500 to 2,500 miles-per-hour class.

Mr. W. J. O'Donnell, chief development engineer of Republic Aviation Corp., maintained that the use of titanium will improve performance to a great extent. He said that in the company's F–84 they can use 130 pounds of titanium and save 55 pounds in weight, which can be converted into additional external loads and which is most important in a fighter bomber. In the case of a model to replace their F–84F the company planned to use some 400 pounds of titanium, at a saving of 160 pounds in overall weight.

In a second appearance before the committee Curtiss-Wright's Mr. Hurley repeated that titanium is a must, and stressed that America should take any step necessary to secure the metal. He stated his company would like to have 3,500 tons in 1956 and 5,800 tons in 1957.

Mr. William P. Gwinn, vice president of the Pratt and Whitney Aircraft Division, advised that in the first quarter of 1954 they anticipated a need of 30 tons, and this would be increased quarterly to a total need of 3,700 in 1957, although the latter figure would be 5,800 tons if the metal were readily available.

THE PROBLEMS

Hearings before the subcommittee indicated, without question, that the problems of the titanium industry are varied and many. These problems are not insurmountable and both Government and Industry have expressed a keen desire to solve them, realizing of course that until such solution has been consummated the full capabilities of titanium cannot be reached.

Following are the principal problems to be met according to the witnesses:

PROCESSING PROBLEMS AND COSTS

Processing costs must be considered for it is the expensiveness of such processing resulting in a costly end product that has held back titanium production and use to a great extent. Testimony indicates the industry has and is willing to continue to spend millions of dollars to bring processing costs within reason.

In discussing processing costs, Crane's Mr. Holloway said that the big factor is the cost increase between sponge and sheet. While many talk of the high cost of sponge at $5 per pound, the fact is that sheet costs $20, leaving a $15 gap with which to work.

Of the titanium limitations, including cost, Mr. K. W. Stalker of General Electric Co., stated "it is expensive to purchase, to process and to control, and it has poor welding qualities and low ductility." However in the next sentence Mr. Stalker said that his company had several programs working to find solutions to the problems.

Mr. Robert Gross (Lockheed) brought up the cost of finished parts, saying that they must be reduced if we are to lick the titanium problem.

Encouragement on the cost feature was given by Mr. L. G. Jenness of the Kennecott Copper Corp., who advised the subcommittee that he looked for a substantial reduction in cost in the foreseeable future.

Reference is made to the memorandum for the three services of the Department of Defense from the Research and Development Board (Office of the Assistant Secretary of Defense) dated August 7, 1952, which stated:

> Two major obstacles have been preventing widespread use of titanium—high cost and lack of assurance of availability in the quantity and quality required. Studies indicate that the high price and uncertain quality of titanium alloys now being produced are to a large extent due to the small tonnages handled and lack of experience in controlling production processes. It is believed that the only way these obstacles can be quickly overcome is to produce titanium in larger quantities, thus reducing high overhead and scrap losses and providing the producers the opportunity, through experience, to develop controls and skills necessary for uniformity of product.

Along this line of uniformity referred to above, Mr. Lowell Gordy of Consolidated Vultee said, in making suggestions to further the titanium industry:

> I think one thing would be a standardization program on specifications. Everybody has his own specification. The Air Force has its specification. Every producer has his specification. Every user has his specification. And no two are the same.

Du Pont's Dr. Gee went so far as to tell the subcommittee on November 23, 1953, that—

> As of today, I could not recommend to du Pont management any further investment for production of titanium metal. Present processes are inherently high in cost. The present market is 100 percent military, and the actual size of the civilian market is unknown.

He did add, however, that if the interests of national defense cannot be met, du Pont would give prompt and serious consideration to Government proposals directed toward further expansion.

Similar fears were expressed by Mr. Richard S. Morse of the National Research Corp. He advised that his company had produced titanium by at least five processes, thereby demonstrating that there

was latitude in processing, but the engineering problem of translating them into commercial production are great and the risks are high.

"We hesitate to take them based on a military economy, which is what we have now," said Mr. Morse.

Mr. Rowley (Titanium Metals Corp.) said that his company's major problem was the Brinell hardness of the titanium sponge. He explained that at one time it was thought that a Brinell hardness of 224 was satisfactory but that it was subsequently discovered that the major share or production should be of the order of 140 Brinell, with the balance somewhere around 160 and not to exceed 180.

Administrator Edmund F. Mansure of the General Services Administration brought up processing also, stating that one of the principal problems was that we are almost at the threshold of new developments in production by several companies, but there have been delays because of the many research questions involved.

SCRAP

Scrap, or to be more specific, the reclaiming of scrap, is no small problem in titanium production, for in all processes developed thus far a tremendous amount of scrap is created and science has been unable to devise a method of scrap usage which would be successful enough to cut down the cost of production appreciably.

General Metzger, in testifying at Henderson on September 28, claimed that about only 60 percent of the titanium sponge turns up in the finished product, due largely to scrap generated in turnings, borings, and the scalping of ingots.

The general had some encouraging information relative to the reclaiming of scrap, explaining that when it was recognized that scrap was accumulating and reaching something in excess of a million pounds in various forms, a scrap process development program was undertaken. He stated that a process developed by Allegheny Ludlum showed great promise and was to be reviewed by the Defense Materials Procurement Agency to determine if the company should receive Government support.

Other progress on scrap recovery has been made. Mr. James A. Roemer, president of Mallory-Sharon Titanium Corp., said that his company had instigated a program for the utilization of internal and external scrap and in this connection equipment had been ordered for cleaning and degreasing scrap. He declared that recirculation of scrap is a necessary factor in the growth of any metal industry. Mr. Fred Lohse of Kaiser Aluminum & Chemical Corp. advised that the titanium production process developed by his company "can readily be modified for recovery of titanium scrap.

Consolidated Vultee's Mr. Lanphier said that his company is "very concerned" about scrap, explaining that the supplier (Rem-Cru) would not take it back unless it were reduced to particles three-eighths of an inch square, oil-free and in lots of a thousand pounds. It is almost impossible to meet these requirements.

In explaining their operations Mr. Hitchcock (Boeing) said that approximately 4 pounds of titanium are required to form 1 pound of finished product, with scrap losses in sheet running as high as 50 percent and Mr. Leo M. Harvey, president of Harvey Machine Co., declared that his people were working on a furnace which would use

all the scrap they could produce and keep it from contamination. "That is only in the talking stage, but I believe it can be done," he stated.

SAVINGS ESTIMATED FROM SCRAP UTILIZATION

Rem-Cru's Mr. Bradford maintained that the supply of titanium metal can be extended and the cost of wrought products reduced through efficient utilization of scrap. He went on to say that through new developments the use of scrap had averaged approximately 10,000 pounds per month for the 6-month period prior to November 23, 1953, or 5 to 10 percent of the ingot produced. He explained further that about 15,000 pounds of titanium turnings purchased from customers and scrap dealers had been used. His company's net accumulation of potentially usable scrap was about 10 percent of its total purchases of sponge, 150 tons of scrap, which would cut the 35 to 40 percent scrap residue to 25 or 30 percent, of which 15 percent is nonrecoverable, according to Mr. Bradford.

POWER

The present shortage of electric power and the problem of getting power supply to equal demand are of vital importance to the national welfare as far as titanium production is concerned. According to General Metzger more electric power is required to produce titanium than is required for an equivalent production of aluminum or magnesium, perhaps a double amount.

It is estimated that 20 kilowatt-hours are required to produce only 1 pound of titanium metal. Requirements for 100,000 tons of metal would be: 4 billion kilowatt-hours, 240,000 tons of ilmenite, 450,000 tons of chlorine and 110,000 tons of magnesium.

According to General Metzger it is the economic law that the ore be brought to the power and never power to the ore. The cost of power doubles for each 400 miles of transmission. Therefore it is necessary that the titanium production industry locate only where there is available an abundance of low mill rate electric power.

The importance of the power feature is underlined by the fact that the power needs of the Titanium Metals Corp. plant at Henderson has taken up the last large supply of surplus hydroelectric power in the country.

A more encouraging picture of the power problem was presented by Boulder City Bureau of Mines witnesses, Messrs. Lloyd and M. G. Mastin (Titanium Development Section), the latter stating that "power is not the bottleneck." He of course was speaking with reservations, they being that power developed locally was not necessarily a bottleneck if some of the raw materials, such as magnesium, were purchased elsewhere.

Mr. Lloyd explained that in their operations, for instance, they were producing titanium at a cost of 6.65 kilowatt-hours per pound of sponge not including the power cost of titanium tetrachloride, magnesium or chlorine as the latter were not produced at Henderson.

In carrying this further Mr. Mastin pointed out that while power as such would be required to produce the products mentioned in the paragraph above necessary for titanium manufacture, these materials need not necessarily be produced at the scene of titanium operations.

He explained that Dow Chemical, the principal manufacturer of magnesium, makes it for about 28 cents a pound, mainly along the gulf coast, and using natural gas in almost unlimited supply.

EXCHANGE OF INFORMATION

Evidence is that the lack of free exchange of information is a natural problem in a fast-moving, competitive industrial America and one which probably would dissolve in the event of an extreme national emergency, but thus far in recent titanium development has remained an irritating thorn at times.

When asked if there had been any interchange of information on the Kroll process, General Metzger stated that there had not been. He said:

> The desirable free exchange of information between the producers, in my opinion, has not occurred. I believe many of the headaches which they have been having—and I refer to Titanium Metals Corp., if I may—could have been eliminated had a free exchange of information been undertaken or provided between the Bureau of Mines, Du Pont and Titanium Metals Corp.

The general went on to explain that Bureau of Mines information would be available to private industry if same were requested. He said further that national defense being a paramount consideration in the titanium program he saw no reason for withholding information on any part of it, to say nothing of the fact that Government underwriting had insured continued progress in titanium development.

Titanium Metals Corp.'s Mr. Smith said that his company did not have any exchange of information with any other producer, only with the Bureau of Mines. He explained the problem of exchanging information developed at a high cost with another company which had very little invested, thereby reducing the incentives toward doing fundamental development work.

Mr. John Ford of the General Services Administration, speaking on Government titanium contracts, stated that to his knowledge there is little, if any, exchange of information between producers, explaining that the policies of the individual companies govern such action, and that there is no provision in the contracts requiring exchange of information.

At the April 7 hearing General Metzger said that there were four problems, or "deterrents" as he described them, to the increased use and application of titanium in aircraft and aeronautical products. Briefly, he described them as follows:

> 1. Quality of material presently being produced and the alloys in which titanium is presently being produced. Quality has not been uniform, and the alloys themselves have not been either uniform or satisfactory to the ultimate use for which the material is required. We do not today have in production a weldable titanium alloy. However, the question of quality and alloying is one which is common to the growth of any new material.
>
> 2. Processing and fabricating know-how. This problem is common to the use and development of any new material, of learning how to use it.
>
> 3. Limited supply: Titanium cannot be committed unalterably in the design of aeronautical products unless there is assurance that the supply will be available to support production schedules of those products to which the titanium is committed.
>
> 4. Cost. Cost of titanium today is such that we must weigh very carefully the use of titanium and its military advantage, its advantage in the application or in the aircraft or in the engine for which we are considering it.

RECAPITULATION OF OUR CURRENT POSITION

As to the supply feature, the trend of testimony indicated that any lack of availability was in the sponge production since titanium ores are readily available. With processing being stepped up and new contracts for production being made it is expected that the sponge supply will become increasingly more plentiful and that this problem can be solved by aggressive action to press for increased supply.

Supply in the next 2 years might be critical due to past delays in solving the metallurgical problems, but this should be a temporary state of affairs to be overcome through continued improvement in technology by the sources now under contract.

As a matter of fact Dr. Kellogg stated that he would not be surprised to see the titanium industry grow to the order of magnitude of 150,000 tons a year within 5 to 10 years.

As to cost, General Metzger predicted that without doubt a reduction would be forthcoming. He explained further that in every instance where an increase in cost is permitted, it must be indicated that the advantage is worth the cost. In being questioned as to the bearing of cost on any slack in production, General Metzger declared, "No, we are not waiting for cost at this point."

In speaking of cost Mr. Hurley (Curtiss-Wright) said plainly:

> Once we go to titanium, we stay with it, and we cannot go back. Cost has nothing to do with that.

At the hearings on April 7, 1954, the Curtiss-Wright Corp. submitted as an exhibit, now in the committee files, an analysis of the production use of titanium in J–65 and J–67 turbo-jet engines. This analysis of cost and supply requirements in their proposed use of titanium for aircraft engines produced by the company showed that even with today's current high cost of titanium and today's manufacturing methods, the company could use titanium in selected engine parts which would provide 20 percent of the potential weight savings from their total titanium program for only about 10 percent of the potential total cost increase due to its use.

Curtiss-Wright further pointed out that the development of parts manufacturing techniques for the specific use of titanium promises not only reduced prices for the above parts but also to make it possible for them to use all of the titanium desired in their engines with the same economy. This would provide a total weight saving of about 10 percent of the present weight of the engine and at an estimated cost of less than $100 per pound saved.

The economies cited do not include the expected reduction in the price of titanium with the coming of increased production volume and added efficiency in the utilization of scrap.

The company has proposed a program for sponsorship by the Air Materiel Command for the study and development of fabrication methods specifically directed toward more economical manufacture of selected aircraft jet engine components. Results from this study would be made available to the entire industry and could be expected to aid materially in removing any possible economic limitations in the necessary use of titanium by the aircraft engine and airframe producers.

In order to establish an economic yardstick for the value of titanium in an aircraft engine, it might be restated from the record that 1

pound of weight savings in an engine yields approximately 8 pounds of savings in an airframe designed around such lighter engines. Previous testimony shows that every pound of weight saved in an airframe is considered to be worth about $40 which would then indicate a value of a pound saved in the engine to be about $320.

Curtiss-Wright submitted estimates of savings by the use of titanium in commercial jet-powered planes. They analyzed the savings in the cost of fuel only from the application of titanium in jet engines used to power typical proposed jet airliners against an estimated cost of $100 per pound of weight saved by titanium use. The net titanium costs, according to their estimate, could be amortized in about 3 years of typical operation from fuel savings alone. Evidence is conclusive that titanium is a must in the manufacture of military aircraft, very desirable in the production of commercial aircraft, and much in demand for the chemical industry on account of its noncorrosive qualities. It is a developing industry.

STATEMENTS OF CRUSADERS FOR TITANIUM

NOTE.—Roy T. Hurley, chairman of the board, Curtiss-Wright Corp., testified that "shortages of titanium was delaying progress in the aircraft production field." He pointed out costs were secondary. "Once we go to titanium, we stay with it, and we cannot go back. Cost has nothing to do with that."

Harold E. Talbott, Secretary of the Air Force, recommended that raw materials for titanium be secured within the Western Hemisphere.

> We should have our own production and protect ourselves here in this country. Where we have an ample supply of raw materials, I see no reason for bringing raw materials from other countries.

Mr. John H. Garrett, Executive Director, Metals Committee, Office of Assistant Secretary of Defense for Research and Development, recommends "that the Department of Defense take action to utilize all available titanium in applications where military advantages are dominant."

Robert Gross, of Lockheed Aircraft Corp., estimated that if the costs of titanium were reduced that it would displace 75 percent of the stainless steel now used in aircraft. He said the—

> costs of finished parts must be reduced * * * if we are to lick the titanium problem.

Gen. Kern D. Metzger, United States Air Force, Chief, Production and Resources Division, Air Materiel Command; and Director of the Aircraft Production Agency:

> The Air Force first became seriously interested in titanium about 3 short years ago, because up until that time, * * * titanium was almost unknown in metallic form. It does possess an unusual combination of intrinsic properties and it has become, in our opinion, a very important structural metal.
>
> The production problems are being mastered with rather amazing rapidity so that within a short period of time it is possible that titanium metal will overtake magnesium in tonnage output.
>
> * * * * * * *
>
> We don't know all about it. But we know many things it will do and we know at this point that there are aircraft fairly well along in design that we need, the country needs to maintain or achieve air superiority, and which must use titanium in substantial quantities.
>
> * * * * * * *

So we have a very great problem in titanium. We have had the same problem in aluminum and magnesium.

With the problems and experience behind us in World War II, we certainly would be remiss if we didn't take the necessary steps at this time in dealing with a new metal such as titanium, to employ it in our weapons in an orderly manner and in consonance with the availability of the material.

The Air Force is interested in titanium for two principal reasons.

No. 1, we believe that this is a metal which can be produced without offshore support. In other words, on the North American Continent there are sufficient ores, in our opinion, to provide not only all the titanium that we can foresee use for and need of at this point, but all that we would need in the event of a mobilization effort, which effort could be supported by the industrial structure of the country.

* * * * * * *

One-pound weight reduction in the engine could result in a 6- to 10-pound reduction in the weight of the airframe. Eight engines at 500 pounds each, a reduction of 4,000 pounds, makes possible 32,000 to 40,000 pounds total reduction in 1 plane. Such a weight saving will give our planes a tremendous advantage in extra load capacity and greater range, speed, and maneuverability.

The first contract for the production of commercial titanium was let in 1950.

He complains that "Progress has been slow—too slow."

URANIUM

The security of America is dependent on so many vital factors that a categorical listing in the order of importance would be an almost impossible task. But surely high on that list would be the uranium-producing ores, the production of which is so strategically important that the Government is the sole beneficiary of the efforts of thousands of prospectors who scurried into the hills to find the magic metal of multiple abilities.

Congress, realizing the necessity for jealous guarding of the mineral, uranium, for defense and possible war purposes, placed complete authority for its distribution and use in the Atomic Energy Commission, whose program began in 1948.

The subcommittee received testimony from reliable Federal and State Government officials and the industry itself on the uranium program in hearings conducted in Salt Lake City on November 12 and 13 of last year, with a brief concluding session in Washington on February 26 of this year. This following summary will serve to review uranium production, some of the problems which need attention, and makes recommendations which may aid in solving these problems.

ATOMIC ENERGY COMMISSION PROGRAM

As indicated above the Congress felt that the strategic significance of uranium dictated that its control be placed in reliable hands, hence the creation of the Atomic Energy Commission, whose cooperation with the industry was commended by many witnesses.

In stressing the need for ore production, Mr. Jesse C. Johnson, Director, Division of Raw Materials, Atomic Energy Commission, credited uranium with probably having prevented thus far a third world war. He stated that in trying to reach maximum military strength the Atomic Energy Commission had assumed the correct course in leaving to the mining industry the business of finding and developing the ore deposits, with the Atomic Energy Commission limiting itself as far as possible to that of assistance, without attempting to control the industry.

Only last February 16, in an address before the American Institute of Mining and Metallurgical Engineers, Mr. Donald L. Everhart, chief geologist of the Atomic Energy Commission, declared that uranium is one of the most important of all metals on the world scene and "it is a matter of national preservation that we find as much of it as fast as possible."

AVAILABILITY

While the witnesses were cautious in making any predictions that the United States and the Western Hemisphere could be self-sufficient in uranium ores in the foreseeable future, the testimony revealed that without question the potential is great, with new discoveries being made at a rather rapid rate.

Mr. Robert S. Palmer, executive secretary, Colorado Mining Association, went so far as to say that we could become self-sufficient in the Western Hemisphere and within this country "with the proper mineral policy," and went on to state that the Atomic Energy Commission had done a splendid job in pioneering in that field (FF 88).

The area known as the Colorado Plateau has been the greatest domestic source. This is a prospector's field, with the ore not being concentrated in one district, but in many, covering approximately 150,000 square miles in Colorado, Utah, Arizona, and New Mexico.

In addition new discoveries have been made in Idaho, Montana, Wyoming, Nevada, and the Dakotas, with mineable deposits in the East, in sections of New Jersey and Pennsylvania.

Mr. Johnson advised the subcommittee that with domestic production increasing in the future, and looking forward to a period when we get into industrial atomic energy power, he of course is unable to say what the requirements are going to be, and—

> I certainly would think that looking ahead, industrial development and atomic power will not be handicapped for many years for lack of uranium.

He added that it was his belief that uranium will be found in large quantities in the United States and in the North American Continent.

PRODUCTION

In speaking of the rapid growth of the program Mr. Johnson stated that in 1953 production has quadrupled that of the period of maximum activity in the area in World War II, and it was expected that the 1953 rate would be doubled within the next 2 years. He said further that the total number of uranium producers as of last November was 525.

It is generally agreed that in the mining industry incentive is a big factor in production. While in the beginning of the uranium program patriotism played an important role, there is no question but that the bonus system of the Atomic Energy Commission has encouraged prospectors to stay in the field.

The purpose of the bonus, of course, is to encourage and assist the development of new sources of domestic uranium production, with the payment being based on uranium content of the ores produced in accordance with Atomic Energy Commission Standards.

The profit incentive was stressed by many of the witnesses, including Mr. Miles P. Romney, manager of the Utah Mining Association; Mr. Palmer, who spoke of a "continuity of profit"; and Mr. John Garcia, State mine inspector for New Mexico. The latter brought before the subcommittee the recommendations of the small producers of his State, who suggested that the system be changed so that more definite tests on bonus eligibility be made to enable producers to determine their eligibility before production begins.

Mr. Sheldon Wimpfen, Manager of the Atomic Energy Commission operations office at Grand Junction, Colo., explained that producers are assured a fair price for their product at the mill and if there is any doubt whatsoever concerning proper determination of the grade of their ore the Atomic Energy Commission has provided the use of umpires, independent certified assayers who are capable of expert analysis.

THE PROBLEMS

Like any rapidly expanding program, uranium production has suffered growing pains. The hope was expressed that on the basis of testimony taken by the subcommittee that future action, both administrative and legislative, may result in decisions that will be profitable to the industry itself and to those who have devoted their time, energy, and resources to its development.

TAXES

From the testimony it would seem without doubt the tax laws as they affect the uranium industry are one of the greatest deterrents to increased production.

Many of the witnesses stressed two phases of the tax laws—depletion allowance and the progressive income tax rates.

Of the former, Mr. Charles A. Steen, president of the Utex Exploration Co., declared that an increase in the depletion allowance (now 15 percent) before income taxes, would be the single biggest factor in getting producers to "pour more money into the industry" and Mr. G. T. Rummel, of the La Salle Mining Co. and chairman of the uranium committee of the Colorado Mining Association, testified that due to the present tax setup he finds himself in the peculiar position of having his ore reserves depleting faster than the tax laws permit him to depreciate his equipment.

He added that the 15-percent depletion is not sufficient to cover tax losses and permit a large enough exploration program to develop new areas.

COMMITTEE'S VIEWS ON INCREASE OF DEPLETION ALLOWANCES

The committee has been urged to favor a substantial increase over the existing 15 percent depletion.

Many other operators offered testimony on the tax structure, including Mr. Vernon Pick, of Grand Junction, who definitely stated the present tax system is handicapping efforts of the Government to increase uranium production. He claimed that he has talked to men in the industry who mine only a few months out of the year to escape higher income tax brackets.

Mr. Pick suggested that consideration should be given to the haulage and development allowances which are not now considered a part of income when calculating depletion. He recommended an increase in the latter from 15 to 27½ percent, the latter being that now given to the petroleum industry.

Mr. Pick said that we should take a look at the Canadian tax system where each new mine is allowed 3 years of development and production free of all taxation providing profits go back into development and are not distributed as dividends. His proposal was echoed by Mr. E. G. Frawley, of Salt Lake City, president of Consolidated Uranium Mines, Inc.

When the uranium hearings were resumed in Washington Mr. Pick submitted a 4-year uranium production tax-exemption plan. Under such a plan the deduction would be taken from the net income computed with the allowance for depletion as follows: First year, 20 per-

cent; second year, 40 percent; third year, 60 percent; and fourth year, 80 percent. He stated this would have the same effect as gradually increasing the depletion allowance progressively for 4 years as follows: 18 percent, 21 percent, 24 percent, and 27 percent.

ROADS

Inasmuch as a large percentage of uranium production is carried on in rugged and hazardous areas, transportation difficulties have been encountered, especially in more recent months with new territory being added to the uranium picture.

Mr. Johnson estimated that more than $4 million ($4½ million to July 1953) has been spent by the Federal Government for access roads and declared he felt it would be a definite setback for the industry if public funds were not available to aid in the construction and maintenance of public roads.

Mr. Rummel stated he was of the opinion that a good road program encourages private industry to develop for production, more ore per dollar invested, than any other project. He recommended that the program not only be continued but expanded in ratio to other aid features set up to expedite exploration and development.

Mr. Harold S. Worcester, vice president of the Colorado Mining Association, also testified as to the importance of a continued road program. He stated his group was asking for much more work on access roads, pointing out that many small miners could open up production if they have proper road facilities.

LEASING, LAND WITHDRAWAL

Another irritable problem has been that of land use, more specifically, land withdrawal, leasing and multiple use of land, and witnesses give their opinions on Public Law 250 (83d Cong., 1st sess.). (Hearings, pt. 9, p. 167.)

The Atomic Energy Act declared that all uranium, thorium, and other ores essential to the production of fissionable material was to be reserved for the use of the United States. In 1952 it came to the attention of the Commission that many of the claims staked on the Colorado Plateau for uranium were on property which previously had been covered with oil and gas leases from the Government to private industry.

In order to forestall any decrease in production the Atomic Energy Commission began leasing these properties to the persons that had staked the claims over the oil and gas lease property, thus enabling the lessee to be eligible for the uranium bonus.

This was followed by the subcommittee's sponsorship of S. 1397 (Public Law 250, 1st sess., 83d Cong.), which prescribed a method whereby a person that had located uranium claims on oil and gas property could validate those claims provided he had staked them between July 31, 1939, and January 1, 1953.

However, there have been many claims staked on the Colorado Plateau since January 1, 1953, on property which had been previously covered by an oil and gas lease, and they are in the precarious predicament of not being eligible for validation for the bonus payment from the Atomic Energy Commission or to be recognized by the Defense

Minerals Exploration Administration for purposes of loans for exploration.

Mr. Johnston testified that while the passage of Public Law 250 did much to clear up the conflict between mining claims and oil and gas leases, he definitely felt that the law had not gone far enough, particularly with so many new locations, therefore he recommended extension of this type of legislation. He said it certainly would be desirable from the uranium miners' standpoint if there were no conflicting interests involved, to be able to locate mining claims on public lands, even though covered by oil and gas leases.

This amended legislation is in the process of consideration by Congress.

He indicated that the Atomic Energy Commission would make certain recommendations along this line.

The president of the Uranium Ore Producers Association, Mr. W. E. Haldane, of Grand Junction, Colo., stated that his group recommended a more equitable method of allocating Government leases. He declared that thousands of acres of withdrawn land would be explored and developed by private enterprise if the land were restored to entry or leased to private enterprise at a nominal royalty.

State Senator Stephen McNichols, also representing the Uranium Ore Producers Association, said he felt the present system of leasing whereby land is withdrawn by the Government and then leased out to operators qualified by experience and financially able, is unfair.

He pointed out that such a system eliminates many applications and suggested that a solution would be a lottery system. In this connection he claimed that any potential lessee with proper experience would have no difficulty in securing sufficient financial backing.

Senator McNichols also objected to the present withdrawal policy, agreeing with Mr. Haldane that much of the withdrawn land would be developed by private industry if given an opportunity. He also recommended that land should not be withdrawn without a commensurate restoral of land, or a commensurate amount of land leased out.

Chairman P. H. Mulcahy, of the Utah State Land Board, spoke at length regarding the leasing program, showing the conflict involved when the Federal Government has withdrawn land originally placed in the title of various land-grant States in their enabling acts and confirmed by the Congress in 1927.

He said there are many instances in Utah wherein both the State and the United States are issuing leases on identically the same land. He recommended that legislation be enacted to protect public-land States and their schools.

As to the efforts being made to clear up lease and title conflicts, the subcommittee heard from Mr. Bryan Mock, regional director, bureau of land management, for the States of Colorado and Utah. He explained that in many cases the uranium miner may discover the ore, help develop the raw materials, and in the end wind up "out in the cold" because of a confusion as to title.

He said this would get the uranium for the Atomic Energy Commission but would not take care of the prospector who had sunk everything he had into the effort.

Many prospectors, in good faith, have gone out to develop uranium, filed mining claims on oil and gas leases, only to discover the confusion

as to who actually owned the land, which of course occasioned Public Law 250.

Mr. Mock said that in his region, through microfilming, mapping, etc., efforts are being made to properly locate leases so that availability of public lands for mineral development can be identified.

He recommended that there be a recordation statute on the public land claims, thereby bringing information together from various sources, which he feels will do more than anything to eliminate one element of speculation in the development of lands by the small miners of this country.

LIME PENALTY

Although little testimony was taken on the lime penalty feature, it is perhaps important enough to be considered further. As explained by Mr. Rummel, uranium and vanadium ores of high lime content cannot be sold without a lime penalty. He said that many properties, especially in the southeastern Utah area, are handicapped by the lime penalty and expressed confidence that the removal of the penalty on high lime ores would greatly increase present production.

BRIGHT FUTURE FOR URANIUM PRODUCTION

There has been substantial testimony that this nation, and certainly the Western Hemisphere, can be made self-sufficient in the production of this vital metal for both civilian and war uses within a very reasonable time if the tax load is modified and a long range incentive unit price is maintained.

COLUMBIUM-TANTALUM

At more than 150 years of age columbium (or niobium) is considered to be a newcomer in the world of metals.

While columbium, a rare metal comparatively, is not as important as many of the other 76 materials on the strategic and critical list, it has found a definite place in modern metallurgy, especially with the advent of jet aircraft.

Like so many metals of the modern age, columbium presents many problems in metallurgy, serving as a challenge to American science.

The subcommittee desired to secure all available information regarding columbium and in the process called in experts from the Government and industry on February 26 of this year and the following summarizes their views:

HISTORY OF COLUMBIUM

In 1801 a scientist named Hatchett discovered a new oxide which he called columbium oxide. The first ingot of columbium was produced in America in 1927 in the laboratory of C. W. Balke of Fansteel Metallurgical Corp.

The discussion of columbium must of necessity include mention of the metal tantalum because they occur together in their important minerals, are similar in many of their properties, and are enough alike chemically to make their separation difficult.

It was 64 years after their discoveries that Marignac developed the first good method for the separation of columbium and tantalum from each other. This method, employing the difference in solubilities of their potassium double fluorides, is still in commercial use today.

COLUMBIUM ORES

Although many minerals are known to contain columbium and tantalum, the only commercially important ores of these metals contain tantalite and columbite. Actually these minerals are one and the same, being called tantalite when tantalum predominates and columbite when columbium predominates.

Tantalum and columbium oxides total about 84 percent of the mineral, while iron and manganese oxides make up the remainder.

Columbium is similar to tantalum in most of its properties but is a little less corrosion resistant, has a lower melting point and is not as strong as tantalum. The chemistry and metallurgy of its preparation are a little more difficult. As a pure metal columbium has no large important commercial use.

As indicated previously columbium, also tantalum, are newcomers in the metal world. Scarcity of ores and comparative difficulty of extraction delayed their technology until specialized methods of processing could be developed.

Columbium is prepared by powder metallurgy methods, since no simple smelting process for reduction of the metal from the ore is known.

COLUMBIUM USE

Military requirements for columbium in the swiftly expanding jet-engine program far exceeded any known or hoped for supply of columbium so, that drastic Government measures had to be taken for allocation, conservation, and substitution.

The function of columbium in alloy steels varies according to the type of alloy in which it is used. The presence of columbium or tantalum, or both, is required in austenitic [1] stainless steels as a carbide stabilizer, and to inhibit intergranular corrosion in the temperature range from 800°–1,600° F. Columbium and tantalum confer high-temperature strength and creep resistance to the important low-iron superduty alloys used for jet-engine parts exposed to extreme heat and operating strain.

Improved ductility and reduction in the tendency to air-harden are imparted to plain chromium stainless steels through the addition of columbium or tantalum.

SUBSTITUTES

Because of the scarcity of columbium great efforts were made to obtain substitutes and replacements for this metal. As a result of these efforts and perhaps also due to the introduction of the new wonder metal, titanium, the use of columbium has been obviated to some extent. For example Mr. Herman H. Hanink of Curtiss-Wright Corp. testified "we are not too sure that the columbium is an absolute essential to our doing the job that has to be done."

He said the only columbium they were using was in the welding rods for the welding of stainless steel. Mr. W. L. Badger of General Electric stated that in one of their engines, the M–252, a nickel base alloy was replacing the alloy, S–816, thus reducing columbium usage. Mr. R. H. Thielemann of the Pratt and Whitney Aircraft Corp. went so far as to testify that since columbium could be a very critical metal should we lose the African source, "we decided we would build engines without columbium, and we have." He estimated that as a rule they were now using 1 or 2 pounds of columbium per engine "but it is something that could be eliminated tomorrow."

CURTAILMENT OF USE OF COLUMBIUM

Mr. D. C. Goldberg of Westinghouse Electric advised that since 1951 their use of columbium has been drastically reduced in all of their engines, that on two models the only columbium being used was in the form of welding electrodes. He estimated that columbium made up under 1 percent of the total critical elements involved in one engine.

A similar statement was made by Mr. Arthur W. F. Green, of the Allison division of General Motors, who said his company had restricted its use only to those components which in the operation of the engine required welding to make the component and were going to be used at temperatures in excess of 800° F. He said his company preferred columbium in the form of tantalum-columbium rather than the separated element.

[1] From the word "austenite," a solid solution of carbon or iron carbide in iron.

UNAVAILABILITY CAUSES LIMITED USE

On the other hand, Maj. Gen. Kern D. Metzger, Chief, Production Resources Division, Air Materiel Command, advised the subcommittee that the requirement for columbium, cobalt, nickel, tungsten, and chrome skyrocketed with the introduction of the jet engine, explaining that columbium is used in high-temperature steels to provide strength under operating temperatures and to overcome oxidation.

The General added further that titanium had relieved their requirement for high-temperature steels to a certain extent. He declared we must plan for higher levels of production and higher rates of production of titanium in the event the world situation should demand such increase in air power.

STRATEGIC USES

Mr. Badger voiced the opinion that columbium or columbium-tantalum is one of the most effective strengtheners available and predicted that trends in the jet-engine industry to still higher temperatures may indicate that even greater amounts of cobalt and columbium per engine will be used.

FUTURE CIVILIAN REQUIREMENTS

Mr. Mitchell Kline, Chief, Rare and Precious Metals Branch, Bureau of Mines, pointed out that because of the desirable qualities of columbium-tantalum for many heretofore prohibited applications, and because of relaxation of controls, the demand for these metals in nonmilitary applications should be expected to increase.

Speaking mainly as to its use in the chemical industry, Mr. Russell Franks of Union Carbide & Carbon Co., declared that in his opinion we cannot eliminate columbium from our economy today without its suffering tremendously. Mr. Franks explained that columbium, as far as the chemical industry is concerned, always is combined with stainless steel.

He said further that columbium is one of the most effective metals which increases the high-temperature strength of alloys and that we should obtain all of it that is in our power to secure, because it will give us the opportunity of using it to the best advantage. Speaking of aircraft it was Mr. Franks' opinion that columbium has played an extremely important part in the jet engine as it now exists.

COST

Mr. Elmer H. Weaver, Assistant Director, Office of Defense Mobilization, explained that inasmuch as columbium had been set up under a Government purchase program the price was set by the Emergency Procurement Service of the General Services Administration. He said he believed the price was raised sufficiently high to bring into production certain marginal ores.

Mr. Albert H. Green of the Emergency Procurement Service pointed out that officials of the Defense Materials Procurement Agency, predecessor of the Emergency Procurement Service, thought the best way to bring into this country or produce domestically more columbium, tantalum and columbium-tantalum would be to pay a

100-percent premium on top of the world price for any of the columbium-tantalum coming in, either produced domestically or internationally, which as of the date of the hearing was $5.60 per pound (see part 9, p. 287).

PREMIUM PRICES THE SAME FOR FOREIGN AND DOMESTIC PRODUCTION

When asked why the Government was unwilling to pay a higher price for columb um produced domestically, it was explained that it was the view of those officials setting the price that there was so little columbium to be found in this country that domestic producers would not suffer. However, it was shown that a considerable amount of columbium-bearing ore is available domestically and that an adequate long-range guaranteed unit price would furnish the necessary incentive for increased domestic production.

There was inserted in the record of the hearings an analysis of Federal assistance for foreign and domestic mineral expansion programs for the period July 1, 1950, through March 31, 1953. This showed that $28,550,000 was spent on the columbium-tantalum program overseas as compared to $5,862,000 expended on the program in this country.

AVAILABILITY OF COLUMBIUM

The scarcity of columbium has posed the greatest problem in extending the use of this important material. The testimony indicated that much more columbium would be used were it more plentiful. Not only is the metal rare to begin with, but that which is being secured must be procured from far corners of the earth which would be inaccessible during an all-out war.

The main sources of our columbium imports have been from Nigeria and the Belgian Congo. There are other foreign sources of supply, which produce only limited quantities, in Bolivia, Brazil, India, Norway, Japan, Mozambique, and Uganda.

DOMESTIC VERSUS FOREIGN PRODUCTION

Mr. Kline (Bureau of Mines) declared that less than 1 percent of United States columbium-tantalum requirements are produced from domestic mines, with Nigeria and the Belgian Congo furnishing about 80 percent of our total supply. Mr. Kline predicted a great future for the recovery of columb um from rutile because the latter is needed for the manufacture of titanium, and added to that there is a much more likely source in ilmenite.

Ilmenite is one of the most plentiful minerals in the earth's surface.

As a result of the Government's incentive bonus purchase program, columbite-tantalite imports in 1953 equaled the previous peak year (1945) and more than doubled 1952 imports, according to Mr. Kline. The total new supply of available combined metal in 1953 was approximately 3.8 million pounds, of which about 10,000 pounds was from domestic mines. Mr. Kline explained that of the 3.8 million pounds referred to, less than 250,000 pounds of metallic tantalum can be produced by extractive processes now in use.

He said, however, that in consideration of the desirable qualities of columbium and tantalum, it would appear that the demand will

increase in proportion to availability, that is, supply will determine demand, this being characteristic of many of the rare metals.

EXPLORATION AND RESEARCH

He recommended that a search for new deposits should be made, explaining that large areas favorable for the concentration of columbium-tantalum minerals in placer deposits, and heretofore unexplored for these minerals, are known to occur in the Western States.

Mr. G. E. Wilson of the General Services Administration, in testifying as to the availability of columbium in Europe, stated that General Services Administration has a small project in Norway financed by Economic Cooperation Administration funds in the amount of $265,000.

STOCKPILE ACCOMPLISHMENTS

Subsequent to the columbium hearing, the subcommittee received some encouraging information on the stockpile program, in the form of a communication, dated March 31, 1954, from Administrator Edmund F. Mansure of the General Services Administration, declaring that their program has been successful in furthering stockpile objectives.

The communication went on to say that "it appears likely that the columbite stockpile objective will be 85 percent completed by late 1955 and filled in 1957."

It should be noted that this prediction apparently is based to a large extent on offshore supplies.

EXPLORATION PROJECTS

Mr. Clarence Mittendorf, Administrator of the Defense Minerals Exploration Administration, said that Government financial assistance has been available for the exploration of columbium-tantalum since the establishment of the Defense Minerals Exploration program early in 1951.

The percentage of Government participation in the estimated cost of any approved project has been 90 percent versus the operators' 10 percent until November 3, 1953, when the ratio of participation was changed to 75 percent on behalf of the Government versus 25 percent to be furnished by the applicant.

Mr. Mittendorf said the Defense Minerals Exploration Administration had received 12 such applications. Of these seven resulted in project contracts, with an estimated aggregate cost of $207,581, of which the Government agreed to contribute a total of $182,790, according to Mr. Mittendorf. Three of the seven projects were located in Idaho, 2 in South Dakota, and 1 each in North and South Carolina. He explained that DMEA does not advance its share of the expenditure but reimburses the operator on a monthly basis, after the operator has spent his own money.

General Metzger testified that "at this time, based upon our current production program," there is sufficient columbium, cobalt, nickel and chrome to satisfy our program, however, he immediately warned that in the world situation as it is we are not privileged to live on a day-to-day basis, that we should plan for higher levels of production

and higher rates of production in the event the world situation should demand such increase in air power. He stated:

"With that rather nebulous requirement in front of us, we do not feel easy at all with respect to the supply of columbium and cobalt, for two reasons: One is that the world supply is marginal to our requirements, and we may not expect it all.

DEFENSE COLUMBIUM REQUIREMENTS MINIMIZED BECAUSE OF OFFSHORE DEPENDENCY

The Defense Department's definite concern, according to General Metzger, is that there be sufficient material available on this continent to support a program of production which might be called for in the event of national emergency.

He stated that in view of the offshore supply that his organization had begun to minimize requirements for columbium, tantalum, chrome, cobalt because "we are aware that the supplies are limited and that they are largely offshore supplies."

Substantiating Mr. Kline's testimony, General Metzger declared that it had been determined that only about 1 percent of this country's columbium and tantalum requirement, is produced in this hemisphere, and that inasmuch as it would undoubtedly take a long time so secure within this hemisphere the needed supply of these materials, "we shall undoubtedly continue to substitute and conserve in those requirements."

When asked as to the vulnerability of our sources in Africa, General Metzger declared flatly, "it is my opinion that they are vulnerable to foreign attack, subversive action, and many other causes for shutdown or stoppage of supply," adding that to the extent possible we should be self-sufficient in our materials, self-sufficient within this hemisphere, and if possible, this continent.

Mr. Clark King of Allegheny Ludlum Steel Co., in speaking of the various alloying elements, predicted that the supply under conditions of mobilization would be very limited unless they are available in the stockpile.

DOMESTIC RESERVES IN ARKANSAS

Regarding domestic deposits Mr. Kline (Bureau of Mines) advised that large reserves of columbium are known to occur in the bauxite deposits and the titanium mineral deposits of the Magnet Cove area in Arkansas. More than 12½ million tons of ore containing 150 million pounds of columbium are believed to be contained in the Magnet Cove deposit, according to Mr. Kline.

Mr. Kline said that more than 200,000 tons of black sand containing 175 tons of columbium are produced annually in conjunction with the bauxite processing industry in Arkansas. In addition, the Arkansas red mud waste product from this industry each year contains more than 2,000 tons of the metal which is also awaiting some economical method of extraction. He added that the black-sand product from the bauxite industry, which contains about 0.08 percent columbium, is a more inviting venture than the Magnet Cove deposits, which contain only about 0.06 percent columbium, especially since the black-sand product is already mined and readily available for processing.

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Mr. C. H. Scott of Denver, president of the Magnet Cove Titanium Corp., reviewed for the subcommittee statements from some of America's aircraft companies pointing out the importance of columbium in the aircraft industry.

He also spoke briefly regarding the Magnet Cove area, stating that the titanium deposit had a great potential possibility both for titanium and columbium.

DOMESTIC RESERVES IN IDAHO

Mr. Perry Moore of the General Services Administration testified that a contract was under negotiation for purchase of a very substantial quantity of columbium-tantalum ores from Bear Valley, Idaho.

Mr. Robert P. Porter, president, Porter Brothers Corp., whose company is engaged in dredging operations in the Bear Valley deposit, advised that this project comprises 11,500 acres. He explained that two dredges working the area would dig approximately 2½ million cubic yards a year, producing between 800,000 and 900,000 pounds of euxenite, which runs 28 percent columbium-tantalum oxide. After smelting, a production of between 220,000 and 240,000 pounds of 90 percent columbium-tantalum oxide is anticipated, according to Mr. Porter. This project has reached the commercial exploitation stage.

According to the Mansure letter of March 31, referred to previously, it now appears possible that a substantial domestic production of columbium and tantalum might be achieved when the necessary exploration, development, and experimental work has been accomplished.

GENERAL SERVICES ADMINISTRATION POLICY ON COLUMBIUM PRODUCTION

Mr. Mansure stated further that in order to develop the maximum possible self-sufficiency in columbium and tantalum, his organization would recommend: 1. Continued and expanded encouragement of exploration for deposits containing columbium and tantalum; 2. Continued Government-sponsored investigations of techniques for mining, milling, beneficiating and refining of ores containing columbium-tantalum; and 3. Encouragement of the submission of individual applications for Government assistance by domestic producers of columbium and tantalum and publicizing the willingness of the General Services Administration to receive such applications.

The Administrator said that sufficient information is not available at this time to permit an accurate determination of the price, quantity, and duration of an additional open purchase program for domestic production which might be expected to succeed in increasing such production.

PROCESSING-RESEARCH ON COLUMBIUM

Testimony on processing research revealed that while much has been done to bring about full use of columbium: because of its rarity and inaccessibility, efforts have turned to developing substitutes for the metal, as a conservation measure rather than emphasizing research

to develop new methods of beneficiation of such ores and the location of new deposits.

SUBSTITUTION OF NICKEL FOR COLUMBIUM

Mr. Green (Allison Division of General Motors) revealed that his company realized that certain materials, especially those from offshore sources could be in restricted supply and not readily available. More than 6 years ago it began an intense research program aimed to determine what could be done to replace columbium-tantalum and cobalt and ended up by substituting nickel for many applications.

General Motors indicated that it had not lost confidence in columbium, for, according to Mr. Green it is possible that even though we have an alloy today without cobalt and columbium-tantalum, that with slight modification of that alloy we might increase its life by slight additions of columbium or cobalt, or both.

SELF-SUFFICIENCY IN COLUMBIUM AWAITS IMPROVED METALLURGY

Mr. Kline (Bureau of Mines) testified that increased United States self-sufficiency in columbium and tantalum depends primarily on the development of improved metallurgical processes and the discovery of new deposits.

He warned, though, that even with new discoveries of complex columbium-tantalum mineral deposits and improved metallurgy, it is doubtful that this country can produce more than 50 percent of our requirements, adding that Western Hemisphere self-sufficiency also depends largely on new metallurgical processes.

Continuing, Mr. Kline stated that in order to fully utilize the desirable properties of columbium and tantalum, improved metallurgical processes must be developed to extract the metals from their ores and to separate them from each other.

The first commercial process for extraction and separation of columbium and tantalum, developed by J. Marignac in 1866, or variations of this process, is the only commercial process in use today, according to Mr. Kline.

This witness stressed the point that in the use of columbium and tantalum ores a large percentage of the tantalum may be lost and since tantalum is especially in short supply, it is felt that in further use of the metal some consideration should be given to extracting the tantalum and separating it from the columbium before using it as a combined metal.

Mr. Franks (Union Carbide & Carbon) advised the subcommittee that his company had found that certain chromium nickel steels, when heated in a temperature range between 800° and 1,500° F., utterly lost all of their resistance to corrosion, and actually disintegrated into a powder in some instances. However, after a considerable amount of research work it was found that columbium was the additive needed to prevent such disintegration.

COLUMBIUM CONSIDERED BYPRODUCT METAL

Mr. R. G. Knickerbocker, regional director of the Bureau of Mines at Rolla, Mo., explained that the columbium resources in the Arkansas

area must be considered as a byproduct of the titanium metal production.

He pointed out that columbium is separated in the making of titanium tetrachloride. Mr. Kline joined in this contention.

Based on the testimony as a whole despite processing and research difficulties, the subcommittee was given reason to believe that even though considered low grade at this time, the ores of Arkansas, Idaho, and other sections of the United States will have great potentialities with improved metallurgical methods.

COLUMBIUM PROBLEMS

The problem of columbium has been recognized by the Defense Department, according to General Metzger, who, in speaking of a supply available in the event of stepping up the program, said:

> That is our concern, very definitely, that there be sufficient material available on this continent to support a production program which might be called for in the event of national emergency.

Commenting along this line Mr. King (Allegheny Ludlum Steel) expressed the opinion that the supply of the various alloying elements, under mobilization conditions, would be very limited:

> We know the demand would skyrocket for these high-temperature alloys (and) unless there are available supplies in stockpile, it would seem to me that there would be a stringent shortage of these things.

Mr. Kline (Bureau of Mines) nailed down the availability problem too, maintaining that for many military aircraft applications titanium is not as satisfactory as columbium but because of the relative availability of the two metals and the quantity required, specifications were based on titanium wherever possible.

Mr. Badger (General Electric) pointed out that should the availability tangles be worked out there remains the problem of metallurgical processing, not that a good start along this line has not been made already.

> The problem that has faced the industry is to develop an alloy which has the best strength and at the same time the most desirable balance, or least amount, of critical elements. Cobalt provides the highest strength base material, short of the refractory alloys, and columbium—or columbium-tantulum—is one of the most effective strengtheners available.

FLUORSPAR

The subcommittee received complaints that the domestic fluorspar industry was suffering from importations of low-cost material in competition with domestic production. This appears to be the major problem facing the industry today and will be gone into subsequently in this report. Hearings were held on October 20, 1953, and in more detail on February 24, 1954, as condensed in the following:

HISTORY OF FLUORSPAR

Fluorspar mining was begun at Trumbull, Conn., in 1837 when a small quantity was sold at $60 a ton, for use in smelting copper ores. It was first mined at Rosiclare, Ill., in 1842, but shipments of commercial significance from Illinois and Kentucky were not begun before 1870. Illinois and Kentucky today are the principal domestic producers in the United States.

GRADES—USES

The name "fluorspar" commonly is applied to the mineral fluorite, calcium fluoride. It occurs throughout the world in veins and beds or as disseminated deposits. Often it is intimately mixed with barite, galena, sphalerite and other minerals.

There are three grades of fluorspar: Acid grade, 98 percent calcium fluoride content; ceramic grade, 95 to 98 percent calcium fluoride content; and metallurgical grade, under 95 percent fluoride content.

The principal use of fluorspar is as a flux in the open-hearth manufacture of steel. Second largest application is for the making of hydrofluoric acid, essential to aluminum metallurgy. The glass and enamel trades are next in importance as users. Fluorine compounds produced from fluorspar are also widely used in refrigerants in aerosols and in the manufacture of uranium isotopes.

CONSUMPTION—AVAILABILITY

Testimony by G. W. Josephson, Chief of Construction and Chemical Materials Branch, Bureau of Mines, Department of the Interior, showed that the United States is the largest consumer of fluorspar in the world, having used 521,000 tons in 1952, with domestic production supplying about two-thirds of that consumption.

Mexico is the largest supplier of foreign fluorspar to the United States and substantial quantities are furnished by Germany, Spain, Canada, and Italy.

Consumption of fluorspar in the United States has jumped from 360,800 tons in 1942 to 521,500 short tons in 1952.

DOMESTIC PRODUCTION

The peak years of domestic production were 1943 and 1944 when United States mines shipped respectively 406,016 short tons and

413,781 tons—however in 1952 the shipments from United States mines fell almost 25 percent from the peak year 1944 to only 333,760 short tons.

Principal domestic production is in the Illinois-Kentucky area, which has contributed about 80 percent of the United States total. The remaining 20 percent was produced in Arizona, California, Colorado, Montana, Nevada, New Mexico, New Hampshire, Tennessee, Texas, Utah, Washington, and Wyoming.

Mr. Josephson declared that in the event of an emergency that might cut off fluorspar sources outside the Western Hemisphere it seems probable that the stockpile and increased production in this country, Mexico and Canada could meet the essential defense requirements.

Fluorspar reserves containing 35 percent or more calcium fluoride would include nearly all the known deposits that are workable under present economic and technological conditions, Mr. Josephson said, adding that reserves of domestic ore containing 35 percent or more calcium fluoride are estimated by the United States Geological Survey to total 15 million short tons at this time—not considering development of latent reserves.

If the reserves in Mexico and Canada are added to those of the United States the total ore containing more than 35 percent is estimated to be 23 million short tons. An additional 500,000 short tons are estimated for other known Western Hemisphere deposits on a like basis. United States reserves of material containing 15 to 35 percent calcium fluoride are estimated to be 20 million short tons on the same basis.

PROCESSING RESEARCH

Mr. Josephson testified that no satisfactory substitute has been found for fluorspar in the manufacture of steel and recommended that more research on this problem is needed. Similarly, hydrofluoric acid is essential in most of its uses, and therefore the opportunity for substitution is limited.

The concentration of fluorspar mined from veins is not difficult if the impurities consist of calcite or silica; if, however, the fluorspar is associated with galena, sphalerite or barite, concentration is difficult. The problem remained unsolved for several years but research carried on by the Bureau of Mines and industry, according to Mr. Josephson, resulted in the development of a froth-flotation process that made it possible not only to separate the harmful impurities but to concentrate them as commercial byproducts.

FROTH FLOTATION

The success of froth flotation led to its wide use not only to concentrate primary mine output but to re-treat accumulated tailings.

Development of a satisfactory flux to serve as a substitute for metallurgical grade fluorspar would reduce the fluorspar requirements and research and development projects directed toward the recovery and utilization of waste fluorine from phosphate-rock processing can increase substantially the domestic production of fluorine-bearing raw materials, according to Mr. Josephson.

When asked what is being done to increase the recovery of fluorine from phosphate rock Mr. Josephson explained that industry, the

Tennessee Valley Authority and the Bureau of Mines had been in the picture. The material recovered in industry now is principally the silicate form which is useful for some applications, such as water fluorination but it does not have the form that is most valuable in industry.

The witness pointed out that TVA had developed one means of producing a calcium fluoride, which is the desirable form because it is a direct substitute for fluorspar. However, it has some serious technical flaws which have prevented it from being accepted as a commercial process today. Mr. Josephson recommended that research be continued because "we feel it is a marvelous opportunity."

IMPORTS

The competition from foreign production was the subject of the February 24 hearing. Congressman C. W. Bishop, of Illinois, presented statements from Mr. Berkley Jones, representing several fluorspar mining and milling companies in Hardin County, Ill., which produces 59 percent of domestic fluorspar, and Mr. Clyde L. Flynn, Jr., attorney, of Elizabethtown, Ill.

Senator Clements presented a telegram from Mr. Robert N. Frazier of the Kentucky Fluorspar Co., Marion, Ky., asking for fluorspar tariff increases to "protect American industry."

The imports of acid grade fluorspar show a tremendous increase from 1,882 tons in 1942 to 107,827 short tons in 1952, of approximately sixtyfold.

Ceramic and metallurgical grade fluorspar importations for 1941 amounted to 6,008 tons. By the year 1952 we imported 251,575 tons—roughly a fortyfold increase in lower grade fluorspar in the 10-year period.

It should be noted that during 1952 shipments from domestic mines combined with imports totaled 693,171 tons as compared to a consumption of 521,500 tons. This surplus went into Government stockpiles and consumer inventory.

The Government has stopped negotiating contracts for the stockpile and the surplus from imports is now a glut on the market thus displacing domestically produced material.

It has been reported but not verified that a cutback in steel industry production has resulted in a substantial cutback in the use of fluorspar which no doubt has added to the distress of the fluorspar industry.

PRICES

Industry representatives claim that prices of the acid grade over 97-percent content CaF_2 has fallen from $65 to $50 a ton. Seventy-percent content ore has fallen from $43 to $35 domestic price, with no takers, and metallurgical grade 40 to 35 percent has fallen from $38 to $33, with no takers. In fact it is claimed that some sales of foreign ores in Chicago, have been made for as little as $24 a ton.

COMPETITION FROM FOREIGN LOW LABOR

The principal complaint from industry stems from the competition of the foreign low labor cost produced materials imported into the United States. Domestic producers, Congressman Bishop, and his

constituents request a higher tariff in order to permit domestic production to compete with the foreign imports.

The following table shows the wage rates being paid in Illinois in accordance with a contract filed with the United Mine Workers of America, local union 12681.

Classification	*Rate per hour*
Hoistman, class A	$1.59
Hoistman, class B	1.54
Underground truck driver	1.64
Miner	1.64
Miner helper	1.54
Underground mechanic	1.69
Mucker or apprentice miner	1.47
Shift leader	1.79
MILL AND SURFACE	
Float operator	1.64
Float helper	1.44
Drier operator	1.54
Crusher operator	1.54
Engineer, class A	1.54
Electrician, class A	1.59
Mechanic, class A	1.59
Summer student labor	1.23
Working foreman	1.64

In comparison, the wage scales paid in Mexico range from 5 pesos a day in Durango to 8 pesos in northern Coahuala. The current exchange rate on pesos are approximately 8½ pesos per dollar, therefore the prevailing wage rate in Mexico runs from 60 to 90 cents per day as compared to the average of $12.80 for an 8-hour day in the United States. In addition the ore produced in Mexico is from higher grade ore at shallow depths. A good proportion of the American mines are vein ore mining operations and necessarily must have a higher cost of production.

TARIFF ACTIONS

For tariff purposes there are two classifications: Acid grade containing more than 97 percent calcium fluoride. Ceramic grade containing less than 97 percent calcium fluoride.

The United States Tariff Commission states:

> The Tariff Act of 1922 provided for a duty of $5.60 long ton on all grades fluorspar.

(At that time United States production consisted almost entirely of metalliferous fluorspar containing much less than 97 percent calcium fluoride.) In 1928 the Tariff Commission under section 315, Tariff Act of 1922 (Flexible Tariff Division), Tariff Commission Report No. M–5 on fluorspar stated as follows:

> The duty of metallurgical fluorspar was increased to $8.40 per long ton. The higher grade or acid grade remained at $5.60 per long ton.

In the Tariff Act of 1930 Congress applied the rate of $8.40 per long ton to all fluorspar containing less than 97 percent calcium fluoride; for the higher grade ore—97 percent or above—a duty of $5.60 per ton. In other words the lower duty was applicable to the higher valued metal, of which this country produced very little at that time. Imports of lower grade fluorspar at that time were in direct competition with fluorspar of this same grade produced by domestic industry.

Since then however improved methods of beneficiation has made possible very great domestic production of acid fluorspar containing more than 97 percent calcium fluoride and the applicable rate of duty of $5.60 is inadequate protection to account for the difference in wages and general costs of doing business.

TRADE AGREEMENT ACT

As a result of trade-agreement action statute duties on fluorspar were reduced and effective January 1, 1939, the duty on acid grade fluorspar was reduced to $4.20 per long ton under a trade agreement with the United Kingdom.

Under the "most favored nation" clause the trade agreement with the United Kingdom applied to Mexico. This was terminated with Mexico on December 31, 1950, and for a 6-month period from January 1, 1951, to June 1951, the duty was fixed at $5.60 per long ton.

Under the Torquay Agreement, GATT, General Agreements on Tariff and Trade, the rate of duty on the same quality of fluorspar was reduced $2.10 per long ton on acid grade fluorspar containing more than 97 percent calcium fluoride.

On January 1, 1951, the rate for the ceramic and metallurgical grade was fixed at $8.40 per ton, which is the effective rate at the present time. In summary the present rates now in effect area:

Acid grade, over 97 percent CaF2 content, $2.10 per long ton.

Ceramic and metallurgical grades, less than 97 percent CaF2 content, $8.40 per long ton.

Congressman Bishop claimed that 50 percent of the fluorspar miners in his district were out of employment as a result of the flow of Mexican ore into the United States, further that "we have more unemployment than in any other part of the country due to these shipments." He maintained that only 4 mines out of 100 in his area were in operation.

Summarized the testimony on fluorspar indicates:

Industry claims that the consumption, which in the past has shown a substantial increase, is now leveling off and at the same time imports are increasing at a much faster rate and when combined with shipments from domestic mines far exceed consumption.

A large amount of acid grade fluorspar being imported from Germany and Mexico under the $2.10 long ton rate is being blended and downgraded into ceramic and metallurgical grades and in this way avoiding payment at the rate of $8.40 per long ton.

Under the tariff law fluorspar is one of the few items wherein the highest value is subject to the lowest rate of tariff.

Industry declares that for the domestic industry to continue to operate the Tariff Act should be changed to require that all fluorspar, regardless of grade, be subject to the duty of $8.40 per long ton.

FUELS

Petroleum fuels—in peace and war—are lifeblood necessities to America and the so-called free world. They are among the tremendously important natural resources requiring a continuing investment incentive to increase the known reserves.

While these hearings have shown that the Government (both Federal and State), industry, and labor are in general agreement as to the problem before us, there is a wide divergence of opinion as to the ways and means to accomplish further development, conservation and use of petroleum and its many byproducts.

Despite past claims to the contrary, the hearings have shown that this Nation is well supplied with reserves of natural petroleum and natural gas for the foreseeable future.

Coal supplies are so far beyond the foreseeable use that the question of adequate reserves is not debateable.

Other forms of energy are in the offing. (NOTE.—In January of this year our first atomic submarine was launched; and in April, the Bell Telephone Laboratory announced it had developed the first practical method for converting solar energy into electricity).

PETROLEUM—GENERAL

The United States, in 1952, produced 293.6 billions of kilowatt-hours from the three fuels: Coal, oil, and gas, according to figures of the Federal Power Commission. Of that total, 195.4 billions of kilowatt-hours, or 66.4 percent, were produced by coal; 29.7 billions, or 10.1 percent, by oil, and 68.5 billions, or 23.3 percent, by gas.

Historical tables and charts showing the rate of consumption of coal, oil, natural gas, and waterpower in the United States from 1900 through 1952, were submitted to the subcommittee by the Bureau of Mines. Summarized briefly the data indicates that the total energy supplied by these various sources increased 391 percent during the period. Since World War II the increase in total energy consumption from these sources has been about 22 percent, and from 1940, 54 percent. This energy consumption increase shows the remarkable growth in our industrial economy, and every indication is that the trend is still upward.

Since 1946 (first full postwar year) the domestic demand for petroleum and natural gas has increased about 48 percent, as set forth by the Petroleum Administration for Defense. This increase was from 4.9 million barrels per day up to about 6.9 million barrels per day in 1952.

Secretary of the Interior Douglas McKay agreed generally that the best method to make petroleum available is to have a going-concern industry, but warned that in case of an all-out war, "we do not have sufficient petroleum products to fight it."

SELF SUFFICIENCY IN FUELS WITHIN THE WESTERN HEMISPHERE

The Western Hemisphere (if necessary) can be entirely self-sufficient in petroleum fuels under any conditions.

Brig. Gen. Alfred H. Johnson, USAF, Staff Director, Petroleum Logistics Division, Office of the Assistant Secretary of Defense for Supply and Logistics, appeared before the subcommittee and testified that the Department of Defense anticipated receiving from industry approximately 200 million barrels of petroleum products to meet its requirements in the fiscal year 1953–54. This is roughly 500,000 barrels per day and represents between 7 and 9 percent of United States consumption of petroleum products for the period mentioned.

PRIORITY ON PETROLEUM DURING AN EMERGENCY

General Johnson stated that the major portion of Defense petroleum products would be used in the United States, followed by the Pacific area, Mediterranean area, Europe, and some in Alaska, Caribbean, Africa, Philippines, and the Middle East.

Of particular interest was a table offered to the subcommittee by Mr. Warwick Downing, chairman of the Oil and Gas Conservation Commission of the State of Colorado. It showed the rentals and royalties accruing to the Federal Government from land leases (oil and gas accounted for 95 percent of the total); increasing from $5,695,532 in the fiscal year ended June 30, 1941, to $43,532,459 for the same period in 1953. Of this amount 37½ percent is returned to the States for schools and roads; 52½ percent goes into the reclamation fund for the reclamation States, and 10 percent is retained to pay the costs of administering the public lands.

ECONOMIC IMPORTANCE OF OIL INDUSTRY

Mr. Downing maintained that the oil industry is an economic necessity to the future of the Rocky Mountain States, and cautioned that any restriction of its development would be a blow to progress.

Officials representing the States of Colorado, Kansas, Louisiana, New Mexico, and Pennsylvania supported the indisputable fact that petroleum production, while at an all-time high, has experienced difficulties that have hampered an even greater production. For example, Mr. John B. Hussey of the Louisiana Conservation Commission pointed out that their production is restricted because of inadequate transportation facilities and a fall off of market demands due to imports, and Mr. Downing stressed the lack of a pipeline to the eastern markets as a handicap to ready distribution.

Gov. Edward F. Arn, of Kansas, accented the point that the domestic petroleum industry is capable of maintaining and increasing its current rate of activity, if given adequate economic incentives and freedom from unnecessary control. He went on to say that the maintenance of an adequate price for both crude oil and natural gas is a prime economic incentive for continued exploration and drilling activity in the petroleum industry.

Gov. Robert F. Kennon, of Louisiana, pointed out that oil and gas are a source of taxation that contributes to the support of the Louisiana public-school system and other governmental activities in the State;

and that imports of petroleum should pay an import duty or tariff the difference in the wages and taxes between this Nation and the chief competing country.

The importance of maintaining a healthy domestic oil industry was underlined by Mr. Jack Porter, Houston, Tex., independent producer, who pointed out the necessity of having adequate supplies of oil available, not only in time of emergency, but also to assure the American people of a sufficient day-to-day supply of petroleum products.

FOREIGN PETROLEUM PRODUCTION VERSUS DOMESTIC PRODUCTION

The problems of petroleum are not at all new, according to Mr. Porter, in recalling the Anglo-American Oil Treaty of 1947 in which strictly domestic producers and those interested in producing foreign crude were at odds as to the ratification of the Treaty.

Those favoring foreign production were supported vigorously by the State Department, also the Interior Department and the Army and Navy. On the other side were the independent producers and some of the larger companies, who contended ratification of the treaty would give the producers in the foreign field the right to ration or allocate world markets and give them immunity from antitrust law violation, as pointed out by Mr. Porter.

Mr. Porter pointed out that to maintain domestic reserves, an incentive policy must be adopted which could well be a duty or tariff based upon the effective difference in the wages and taxes here and abroad.

PETROLEUM RESERVES

(NOTE.—It should be pointed out that "reserves" as discussed for the main part herein, are "proved reserves," or, "in sight," conservative estimates based on facts as distinguished from latent unexplored reserves which experts agree are vast.)

As of January 1, 1953, as set forth by World Oil, the petroleum reserves in North and South America were estimated at 42,995 million barrels. Of this total, the North American reserves made up 32 billion barrels, of which 29 billion were in the United States, not including natural-gas liquids of which we had in this country some 4 to 5 billion barrels. As to the other countries in North America, the picture was as follows: Canada, 1,750 million barrels; Mexico, 1,700 million; and negligible quantities in Cuba and Alaska. Of the South American total of 10,995 million barrels, Venezuela alone was credited with 9,600 million.

American Petroleum Institute figures on underground reserves of crude petroleum in the United States showed an increase from 20.9 billion barrels in 1946 to 28.0 billion in 1952.[1]

VIEWS OF STATES REPRESENTATIVES ON OIL

Witnesses from the States appearing before the subcommittee substantiated other testimony, indicating that our latent petroleum reserve picture is encouraging, with the possible exception of Pennsylvania (whose production is limited to a quality crude especially suited for lubricants).

[1] Reserves crude on January 1, 1954 now 28,944,828,000 barrels

One of the State witnesses emphasized the point that it has been through the use of our resources—not withholding them—that the industry has been encouraged to explore for new reserves.

Intensive operations abroad were again pointed up by Mr. J. W. Foley, vice president of the Texas Co., in comparing United States reserves with the world's crude reserves. At the close of 1937, this country was credited with total crude reserves of 15.5 billion barrels, or 52 percent of the world's supply; whereas, at the end of 1952 our reserves increased to 28 billion barrels, but this represented only 24 percent of the world's supply. While United States reserves almost doubled in the past 16 years the United States percentage of total world supply is now less than half of what it was before.

INDEPENDENT PRODUCERS URGE INCREASE OF OIL RESERVES THROUGH EXPLORATION

Testimony of some of the smaller independent producers strongly indicated that the only way to build up our reserves is through exploration which can be encouraged only through the incentive of a profitable return on the investment. The system of possible incentives includes three factors: (1) Incentive taxation (depletion allowance); (2) adequate price; (3) adequate market. Apparently, these incentive factors are the key to continued expansion.

It is important to note the conflict of views regarding reserves. One of the industry witnesses related how since 1891 certain officials in the Interior Department, joined by the State Department in 1947, have predicted we were running out of oil, as opposed to the views of the National Petroleum Council (organized at the behest of the Secretary of the Interior and comprising of a good cross-section of the American petroleum industry), which, in its report submitted to the Secretary on July 29, 1952, said:

> This report answers recurrent fears that we are running out of oil * * * the outlook is for an increasing supply of oil and gas in the United States.

Major conclusion of this report was:

> The United States and the world can count upon increasing supplies of oil and gas not only for the next few years but for the foreseeable future provided that reasonable economic incentives, adequate materials, and a favorable climate for private investment prevail.

INDUSTRY ESTIMATE ON PETROLEUM RESERVES

Mr. A. C. Rubel, vice president of the Union Oil Co. of California, stressed that under free enterprise the development of unproven fields is the lifeblood of a company. He stated that his organization is spending as much as possible to develop new sources of oil to augment present reserves. Mr. Rubel claimed that the public has been given false information as to crude reserves in the United States, which he stated to be 33 to 35 billion barrels, having doubled in the past 13 years, and with advanced technology undiscovered reserves might be placed at 100 billion barrels.

PETROLEUM IMPORTS

During the past several years imports of both crude petroleum and petroleum products have shown a steady increase, according to the figures of the Petroleum Administration for Defense.

Year	Crude	Products	Total	Year	Crude	Products	Total
1946	[1] 236,000	[1] 141,000	[1] 377,000	1950	487,000	363,000	850,000
1947	267,000	169,000	436,000	1951	490,000	354,000	844,000
1948	353,000	161,000	514,000	1952	573,000	385,000	958,000
1949	421,000	224,000	645,000				

[1] Thousands of barrels per day.

This source estimated that as of November 30, 1953, we were importing crude at the rate of 650,000 barrels per day, or approximately 8 percent of our total demand. The Assistant Deputy Administrator, H. A. Stewart, said these imports were not needed for national defense.

It was maintained that the Petroleum Administration for Defense does not participate in the import picture, although it was agreed that imports were partially responsible for decreased production in the United States.

The great majority of the witnesses from the various States, did not hesitate to recommend that the 1934 Trade Agreements Act be allowed to expire on June 12, 1954, thereby reverting tariff policies to the United States Tariff Commission, whose direct authority is granted by the Congress and subject to check by that body.

A review of the stand taken by these witnesses is revealing:

IMPORTS AND THEIR EFFECT ON DOMESTIC PRODUCTION

New Mexico.—Domestic producers are in direct competition with imported oil. It is cheaper to put foreign crude into the east coast than it has been to produce it in New Mexico, where production is off about 17½ percent. Because of a decreased market demand, New Mexico as of the latter part of last year, was producing only 75 percent of the petroleum produced in August of 1952. The State law requires that production be keyed to market demand and the allowable oil be prorated accordingly. New Mexico officials declared that imports "very seriously" affect the market demand.

Texas.—Gov. Allan Shivers of Texas said "World freedom depends upon the economic and military strength of the United States. Excessive oil imports today are undermining both * * * excessive oil imports retard exploration and drilling in the home industry. Particularly dangerous to our national welfare is the increasing reliance upon cheap Middle East sources for oil to meet our own consumptive demands." It was said that Texas is the only State having drastic proration of oil, production of which is allocated by the Texas Railroad Commission.

(See appendix VII for letter from Governor Shivers.)

Louisiana.—Production reduced due to imports of foreign oil and oil products, and the failure of the companies to reduce their imports in the same manner that the States have been required to reduce their production. Foreign oil does not bear its fair share of the cost of

government. Reduced "allowables" last October necessitated a cut of $450,000 for schools.

Louisiana has cut production approximately 10 percent and is considering further reductions. It would be disastrous to America, to the American oil industry, and to Louisiana in particular to allow imports to supplant domestic oil in the American market.

Kansas.—Producers understand that imports are at an all-time high. Imports will cripple their industry. Imports should not be stopped entirely but should be curtailed somewhat and not be permitted to go up and up. Kansas, through its corporation commission, has endeavored to regulate the production of oil and gas efficiently and in a spirit of cooperation with the industry.

Colorado.—"Let us fight like Americans for America. Let our prime concern be to build our own resources in order to make us strong. Let us begin by stopping this excessive flow of middle eastern oil and let us do it by legislation."—Mr. Downing.

Wyoming.—Gov. C. J. Rogers appeared only briefly before the subcommittee; however, he stated that producers in Wyoming were finding it difficult to dispose of their oil because of imports from Venezuela and the Middle East, it was expected that Canada might be competitive also. He agreed that reduced domestic production would discourage the incentive to find new oil.

States producing approximately 73 percent of the United States total crude have effective proration laws. In general these laws are designed to limit production of crude oil and natural gas to levels which will not damage the petroleum reserves involved, and to levels comparable with current market demand, thereby prohibiting waste.

Representatives of companies engaged in large-scale import business defended imports.

INEQUALITY OF DOMESTIC COMPETITION WITH VENEZUELAN PRODUCTION

There are 15 oil companies operating in Venezuela and the majority represent a United States investment. Principal exporters of Venezuelan oil to the United States have been the Creole Petroleum Co. (Standard of New Jersey) and Shell.

It is of interest to note the tax status of Venezuelan petroleum exported to the United States. It was pointed out that Creole pays a United States tax only on its investment income in the United States. In other words, in most cases, when petroleum is imported from Venezuela the company pays no tax to the United States but only to Venezuela. The income tax on profit paid to the Venezuelan Government is approximately 40 percent, plus a royalty which averages one-sixth of the value of the oil.

Creole does not favor any "equalization" measure to balance out the wage rates between Venezuela and the United States. They declare that under these circumstances the United States would have to give Venezuela a "refund," pointing out that the labor cost per employee in the Venezuelan oil industry is higher than in the United States, that in the past decade Creole labor costs have been in excess of the United States average. In 1950, for example, the average costs per employee were $3,834 in the United States and $5,397 for Creole, according to the latter's figures.

In supporting continued imports the Shell Caribbean Petroleum Co. maintained that if any restrictions were placed on Venezuelan imports into the United States, the effect on the Venezuelan economy would be such as to necessitate their cutting down on imports from the United States.

American oil companies set out to develop foreign sources of oil with the encouragement of the United States Government, according to the Texas Co. testimony, and it was through the efforts of these companies that we today have potential access to billions of barrels of oil abroad, located in strategic places vital to our military forces which otherwise we would not have.

The company also asserted that statements that imports are adversely affecting the industry cannot be borne out by the facts, claiming that imposition of import restrictions would be damaging to the national welfare; that such a policy would soon be reflected in reduced exports, relations would be strained, and the Communists would be quick to seize upon any such break.

DEGREE OF AMERICAN OWNERSHIP OF ARAMCO

One of the largest operations abroad is that conducted by the Arabian-American Oil Co., known as ARAMCO, whose oil production, except that used in Saudi Arabia, is sold direct to its parent companies: (percent refers to portion owned by each company) Standard Oil of New Jersey, 30 percent; the Texas Co., 30 percent; Standard Oil Company of California, 30 percent; and Socony Vacuum, 10 percent. As of late last year ARAMCO crude production was between 800,000 and 900,000 barrels per day. Of the total about 180,000 barrels per day are refined at Bahrain, 300,000 barrels are pipelined to the Mediterranean area and 200,000 barrels are refined in ARAMCO's own plant. The remainder is loaded for tanker shipment directly from the Middle East.

The Mediterranean pipeline oil is loaded into tankers for sale to the parent companies for marketing, mainly in Europe, and some in the United States. European recipients include almost all of the European nations from Norway to the African coast, on this side of the so-called Iron Curtain, according to ARAMCO.

Mr. James E. Pew, manager of the natural gas division, Sun Oil Co., was outspoken in making the claim that the United States has grown strong on a free economy * * * that he feared the outcome if the tariff question were left to the guidance of the State Department.

Equally unrestrained were those witnesses representing the independent producers, all declaring that steps must be taken to offset the cost differential between imports and home production. These same witneses expressed the conviction that they were not opposed to "fair and reasonable" competition from either overseas or within our own borders.

Mr. Rubel, vice president of the Union Oil Co., stated that while we must depend on outside sources as time goes on, there is no good reason why we should deliberately encourage and exaggerate our dependence on foreign supplies of crude oil when we have within our territorial boundaries untapped sources of liquid fuels which, if developed, would go a long way toward offsetting such dependence.

He expressed the definite opinion that excessive imports are the surest way to reduce our ability to provide our own requirements,

explaining that as the income of the domestic producer is lowered, his ability to explore will be curtailed.

EFFECT OF PRODUCTION CURTAILMENT ON EMPLOYMENT

Regarding the effect on employment when operations are cut down from a 30-day month to 17 days (as it was testified was being done in Texas) this witness explained that the immediate effect was not apparent but as soon as the producers began to recast their financial situation they would cut expenditures to fit the cloth. He stated his own company had discontinued all development drilling consistent with their lease requirements and if the situation does not improve they will have to cut their exploration budget.

As to regulating imports, Mr. Rubel suggested that every possible effort should be made to secure some voluntary agreement among the importing companies to reduce and maintain an import rate that is supplemental to our national requirements, and failing in that, go back to the time-honored system of tariffs, which should be flexible.

AMERICAN INDUSTRY IS THE NO. 1 RESPONSIBILITY OF AMERICAN INDUSTRY AND THE AMERICAN PEOPLE

Mr. Rubel sounded a note heard many times throughout the hearings—American industry is the No. 1 responsibility of American industry, and the American people.

The Texas Independent Producers Association, representing 5,000 members, voiced the fear that a continuation of our trend toward sharply rising oil imports, combined with our already near complete loss of export markets will at the very least, put out of operation, enough small producers to cause the virtual abandonment of exploration and drilling activity at home, which in due course, would make America a have-not nation. It was pointed out that through 1947 we were a net oil exporter, but now imports are topping a million barrels a day and our exports are just over 300,000, of which more than one-third goes to Canada.

In illustrating how oil imports fail to adjust to supplemental levels, the association claimed that imports increased between 1948 and 1949 from 514,000 to 646,000 barrels per day, although the domestic production of crude was reduced nearly 500,000 barrels in order to correct the accumulations of inventories that had accrued in 1948 to balance the supply with demand in the face of increasing imports.

Then again, in 1953, despite rapidly increasing reserve productive capacity here, imports of foreign crude increased from 616,000 barrels per day in January to 659,000 barrels per day in October while at the same time domestic production had to be reduced from 6,555,000 barrels per day in January to 6,237,000 barrels per day in October because of a decrease in demand for crude oil.

The association maintained that it is generally agreed in the oil industry that Middle East oil has an approximate $1 per barrel price advantage over east Texas oil in the New York port.

The association claimed that we are getting more than 20 percent of our imports from the Middle East, where production has skyrocketed from 700,000 barrels daily in 1946 to 2.3 million barrels today even without Iran's 700,000-barrel daily capacity.

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The association recommended that the subcommittee give consideration to a flexible tariff policy to restore to Congress through its agent, the Tariff Commission, the authority to adjust the duties or tariffs to prevent the displacement of any home industry vital to America's economy.

In making this recommendation it was asserted that our present trade policy is subordinated completely to the whim of the State Department.

Mr. Harold Decker of the Houston (Texas) Oil Co., in a letter read to the subcommittee, declared that the recent rapid increase in imports of cheap foreign oil produced at very low wage rates and with no regulation as to production, has endangered the market for domestic oil.

CHANGING PETROLEUM PICTURE SINCE WORLD WAR II

Charging that imports have reached an astonishing figure of about a million barrels per day because of Government intervention and encouragement, the Independent Petroleum Association of America presented to the subcommittee a chart showing that prior to World War II the United States was a substantial net exporter of oil, but following the war imports rose rapidly while the general trend of exports was downward.

These trends were interrupted in 1951 by the removal of Iranian oil from the world market, thereby stimulating United States oil exports and exerting a restraining influence on imports. However, preliminary figures for 1953 showed a large net importation, with total imports exceeding total exports by 667,000 barrels daily.

This association further claimed that in December 1949 the first trade agreement with Venezuela became effective, reducing petroleum import fees and constituting an expression of Government policy toward the encouragement rather than limitation of these imports.

Industry witnesses agreed that excessive imports cut down venture capital, which is vital, because it is the wildcatting operations which are necessary to find new oil.

PETROLEUM PRODUCTS (RESIDUAL)

(NOTE.—Residual oil is an industrial fuel, sold in competition with coal and natural gas and is used to power ships, railroads, heat large buildings, etc. As the name implies, residual is that which is left after gasoline and oils of lighter qualities have been taken from petroleum.)

Witnesses representing some of the larger importers of residual oil defended the practice, declaring that their customers need such an additional supply to supplement domestic production.

Shell, for example, imports residual from Venezuela, and the purchasers in this country fall into two classes: (1) independent distributors from Florida to Maine; and (2) a limited number of companies who import in their own name, although the quantity is relatively small compared with that taken by the independent distributors.

EFFECT OF RESIDUAL OIL IMPORTS ON DOMESTIC ECONOMY

Without doubt the American coal industry has been hard hit by importation of residual oil. As a matter of fact the National Coal Association, a trade organization of the bituminous coal-mine owners

and operators in the 28 coal producing States, claimed that the importation of residual oil is No. 1 of two major handicaps faced by the industry (the other being natural gas).

The association declared that foreign residual oil was being dumped on the industrial fuel markets of the eastern seaboard at such a rate that the group passed a resolution October 21, 1953, urging the Congress to provide for an adequate quantitative limitation on imports of foreign residual fuel oil.

This group made the claim that residual imports rose from 45 million barrels in 1946 to 128 million barrels in 1952, underselling coal and destroying its market, causing mines to close, impairing capital investment, retarding exploration for new fields, decreasing potential traffic for American railroads, reducing the opportunity for livelihood for many thousands of workers, threatening the existence of thousands of small-business men, and imperiling the Nation's security by building up an unwise dependence on foreign oil sources, which admittedly would not be available in the event of an all-out war.

It was estimated that the importation of residual oil at the 1952 rate will result in the following economic losses to American industry and labor: (1) Coal producers, $165 million; (2) railroad revenue, $94 million; (3) coal miners, $84 million in wages (equal to 23,000 jobs for 1 year; (4) railroad labor, $47 million in wages; (5) taxes (Federal, State, and local—direct), $43 million.

The association recommended legislation along the lines of a 5-percent quota limitation on residual-oil imports, along with adoption of a fuel policy. Also joining in this recommendation were witnesses representing other groups engaged in the production of coal.

STATE DEPARTMENT OPPOSES PROTEST OF UNITED MINE WORKERS OF UNRESTRAINED IMPORTS OF RESIDUAL OIL

Mr. Thomas Kennedy, vice president of the United Mine Workers, placed in the record a letter, dated March 25, 1953, which he wrote Secretary Dulles protesting unrestrained importation of residual oil. The reply from the State Department, dated April 10, 1953, said:

> Our analysis does not seem to lead to the conclusion that residual fuel-oil imports are a major cause of market difficulties for the coal-mining industry. These difficulties seem to have resulted primarily from the dieselization of the railroads and the decline in retail deliveries of coal. * * * The effects of any restriction of residual fuel-oil imports would be very important in our foreign relations.

Quoting from the March 1953 issue of Coal Age, an analysis, "Who Uses Residual in the East and Appalachians," the United Mine Workers pointed out that in the period from 1946 to 1951 there was an increase of residual consumption of 52.9 percent in smelting, mining, and manufacturing; 13.2 percent in vessels; 43.6 percent in heating; 114.7 percent in electric utilities; 39.7 percent in railroads; 44.8 percent in gas utilities, while falling off only 8.8 percent in oil companies.

This same issue of Coal Age stated that the 128 million barrels of residual oil which flooded our east coast in 1952 were equivalent to more than 30 million tons of coal.

PETROLEUM IN WAR AND NATIONAL DEFENSE

Gen. Alfred H. Johnson testified that the military places its greatest dependence on petroleum to fuel a war on sources within the United States. He pointed out, however, that petroleum is a world commodity and the Department of Defense believes that oil for war is a hemisphere problem, rather than solely a domestic one.

He stated further that our allies are essential to our national security, therefore we should make very effort to insure that those allies who may be going to assist us in any future emergency have adequate petroleum supplies.

The Western Hemisphere, according to General Johnson, is the surest source of petroleum for the United States and her allies in time of emergency, and depending on when that emergency came, the Western Hemisphere would ultimately become dependent to some extent on Eastern Hemisphere petroleum.

One of the witnesses quoted from a statement made by Mr. John D. Small, former Chairman of the Munitions Board, dated November 7, 1952:

> At the present time the military is purchasing some petroleum products from other than west coast sources for delivery to the Pacific Ocean areas. This has been necessary because of a shortage of products on the west coast to meet all requirements. If an additional supply of crude oil can be made available to the west coast under favorable economic conditions, it would enable west coast refiners to operate at a maximum capacity and would be a partial answer to the current west coast shortages.

Also on west coast shortages, the Petroleum Administration for Defense, on November 15, 1952, stated:

> The seriousness of the shortage is indicated by the fact that the military have been forced to purchase approximately 37 percent, or 50,000 barrels per day, of its west coast requirements, from the United States Gulf coast and Caribbean ports, at a substantial increase in cost. * * * This is both an abnormal and uneconomic operation for the military and is not in the best interests of national security and the national defense effort.

All witnesses representing the various States proclaimed their willingness to bring about all-out production in time of national emergency, but hastened to warn that full production in time of urgent need would depend wholly on a healthy industry in time of peace and without unnecessary interference with the free enterprise system.

One of the most outspoken of these stated that the greatest issue before America today is whether we can survive as a free nation * * * that our only safety lies in building up our strength. He added, that in case of an emergency

> —not one barrel of middle eastern oil could be shipped to us and even Venezuelan oil would be shut off.

One of these industry witnesses, Mr. Russell Brown, Secretary of the Independent Petroleum Association of America, was quick to point out that had the Government opinions that we were running out of oil prevailed, we would have been woefully unprepared for World War II, and the Korean conflict.

> Fortunately—he stated—the Congress has taken a contrary view and followed a legislative program, which, in the main, has served to encourage and permit a continual expansion of oil activities throughout the United States.

Mr. Brown reminded the subcommittee that while the Department of State now administers our 1934 Trade Agreements Act, the Secretary of State has testified that his responsibility is international and not in domestic affairs. Thus we have a conflict in foreign trade that tends to result in a distortion of the balanced condition our economy and national security requires.

Again regarding the west coast shortage of petroleum, the claim was made that during the last 14 months of World War II the Government paid $111 million for rail transportation charges alone for the movement of crude oil and petroleum products from interior points to the west coast.

These great expenditures appeared again during the Korean conflict, when the military paid a million dollars monthly excess premium to move petroleum purchased on the Gulf coast and elsewhere through the Panama Canal for its operations in the Pacific.

It was stated that the Armed Forces Petroleum Purchasing Agency, on October 21, 1952, sent a report to the Munitions Board, emphasizing the exposure of the military because of the absence of a pipeline link between the oil producing areas of West Texas and New Mexico and the oil short west coast.

Mr. L. M. Glasco of the West Coast Pipeline Co., pointed out that the military is the largest single purchaser of petroleum products in the world. He recommended a solution to the west coast oil shortage by construction of a pipeline, either with the aid of several companies in cooperation, or by the military itself. In any event the military would have to guarantee that a part of its use would be transported by such a line.

While there have been suggestions that Canada furnish west coast oil, Mr. Glasco maintained that the United States cannot depend on this source, for, according to reports of the Petroleum Administration for Defense, the Canadian civilian economy requires 500,000 barrels per day while production of crude remains at 260,000 barrels per day.

PETROLEUM RESEARCH

Before beginning the discussion of petroleum research it might be well to quote from the President's Economic Report, submitted to the Congress in January of this year:

> While Federal expenditures were being cut in many directions during the past year, outlays on research and development grew and came to $2½ billion out of a total national expenditure on research of $4 billion. Research has already given us many new industries and products. * * * Outlays on the building of new knowledge must continue since they are our surest promise of expanding economic opportunities.

Since the inception of the Bureau of Mines in 1910 its research staff has been engaged in technologic and scientific research on petroleum and natural gas, with two broad objectives: (1) To develop engineering data to assist operators in increasing the recovery of oil and gas from known deposits; and, (2) to provide basic information about the properties and composition of petroleum and its components and of petroleum products which may be used by the refining industry to improve products, make new products and increase the benefits from utilization of petroleum. This two-fold objective is to reduce the quantity of oil left underground beyond recovery when the economic

limit of operations is reached and to make the oil that is produced go farther through increased efficiency in utilization.

As to production research, the Bureau engineers working on this program were among the first to recognize the importance of solution gas and gas caps as sources of energy for production of oil and the need for maintaining producing gas-oil ratios (cubic feet of gas required to lift a barrel of oil) at a minimum. In 1929 an extensive report was published in cooperation with the American Petroleum Institute showing the important function of natural gas in the production of oil and the need for conserving same for this purpose. The publication of studies on "bottom hole" samples of crude oil which supplied basic scientific data upon which to formulate operating procedures that have increased the recovery of petroleum by many millions of barrels, also is worthy of recognition.

The Bureau feels that fields now known, without further discovery, will produce more oil if the technology is improved, and research will improve that technology. Another important factor is cost versus price—if we reach the point where income and outgo are equal production is stymied, but the cost can be reduced through improved technology and better business methods.

Bureau witnesses stressed the fact that their research program is conducted in close cooperation with the petroleum industry, and as the Bureau has no oil producing properties, refineries, or oil pipelines, the use of such facilities and data relating to them for research purposes is obtained through the generous cooperation of the industry. As a matter of fact, industry committees review much of the program periodically, advise the Bureau on the work, and make financial contributions to speed up the progress.

OIL SHALE

Secretary McKay told the subcommittee that the Department of the Interior is still working to reduce the cost of obtaining petroleum from oil shale, which it was estimated costs about 2 cents or more per gallon than from natural petroleum, depending on the desired return on investment.

The Secretary stated that he would approve going beyond the pilot plant stage because it might take 2 or 3 years to construct such an operation to prepare for an emergency—if the technical advisers on his staff approved it but he does not feel that we should build a plant to secure petroleum that will cost more than the crude we can get out of the ground. The Secretary said such a decision would be the prerogative of the Congress.

General Johnson recommended that everything possible should be done to encourage development of ways and means of producing petroleum products from oil shale, and the Bureau of Mines pointed out that we have oil shales to fall back on when the cost of petroleum goes up; and coal stands back of oil shale for production of liquid fuels with an almost inexhaustible supply.

RESERVES

As to reserves of oil shale, there is a plentiful supply in the Western Hemisphere, according to Bureau of Mines testimony. The reserves of potential oil in the shales of Colorado, Wyoming, and Utah are large,

perhaps near 200 billion barrels, and they are very rich. Also, there is considerable shale in Canada, although the reserves have not been charted, and there are large deposits of rich shale in Brazil with potential perhaps as large as that in the three States mentioned above.

TECHNOLOGY

From a production standpoint the Bureau pointed out that in oil shale there is no discovery cost—it is there in plain sight. The Bureau has been working on a continuous operation retort system for production of oil from shale. Two retorts are being tested, one by the Union Oil Co. and the other by the Bureau of Mines, but both have drawbacks and may not be used for commercial operation.

In explaining further the Union Oil Co. retort system, an official of that company related that in 1948 they developed a 3-ton per day retort which recovered practically 94 percent of the assayed value of the shale. Later a 50-ton per day unit was developed and a 1,000-ton unit was being designed.

This official stated that both the Union Oil Co. process and the gas combustion type used by the Bureau of Mines at its plant at Rifle, Colo., fulfill requirements by using no water and both appear to have a large volume output.

It was recommended that even though imperfect, both of these retorts are sufficiently developed to justify proceeding with a full-scale unit on a superpilot plant. While we may not need a $300 million 50,000 barrel per day plant now, it is important that we know how to build such a plant quickly when the need does arise

GOVERNMENT AND INDUSTRY SHOULD COOPERATE ON PILOT PLANT

The suggestion was made that industry, in cooperation with the Government, should build and operate a large-scale oil shale plant and even though it had to be put on the shelf for emergency use, at least we would not have a repetition of frantic and fantastically expensive development such as with synthetic rubber and toluene, during World War II. It was further stated that such an operation would be the cheapest insurance against a serious and perhaps a critical shortage of liquid fuels in time of war.

Research may play a large role in the reduction of the cost of the oil shale processes, according to the Bureau of Mines, especially research on refining. The biggest elements of cost are in mining and refining, with actual retorting costs comparatively small. As to mining, an excellent job has been done, with some improvement to be had in safety and efficiency, whereas on refining much exploratory work remains to be done. The retort system is well-known but efforts are being made to get a more operable process.

OIL SHALE DEPOSITS

Apparently the greatest concentration of oil shale in the United States lies in the Green River formation in northwestern Colorado. It was claimed by the Union Oil Co. that this area is capable of producing billions of barrels of high quality liquid fuels as well as large quantities of ammonia, sulfur, coke, and fuel gas. The Green River Basin

area measures 1,000 square miles and is underlain by oil shale 500 feet thick and averaging 15 gallons of recoverable oil per ton, according to the Union Oil Co.

The lower portion of the Green River formation, known as Mahogany Ledge, and which is the only part of the Green River Basin which would have any commercial possibility in the foreseeable future under present recovery methods, is estimated to be able to provide 100 billion barrels of petroleum. At a production rate of 250,000 barrels per day this deposit would last a little over 1,000 years, according to the Union Oil Co.

It is difficult to estimate the real possibilities of oil shale. Prof. Tell Ertl, professor of mines and petroleum engineering at Ohio State University, told the subcommittee that no complete investigation of oil shale has been made, except in the Colorado area.

NATURAL GAS

Figures on proved reserves of natural gas, based on estimates of the American Gas Association, were furnished the subcommittee by the United States Geological Survey. These showed that beginning in 1941 we had a reserve of 113 trillion cubic feet, with a drop to 110 trillion in 1942 and 1943, and from then on a steady increase to 200 trillion cubic feet at the beginning of 1953.

It was estimated that if the 200 trillion cubic feet of natural gas reported as of the first of 1953, were converted into an equivalent amount of crude oil on a heat content basis (600,000 cubic feet of gas equal to a barrel of oil) we would arrive at a figure of 33 billion barrels of oil in reserve as natural gas, plus another 5 billion barrels of liquids contained in that natural gas—this of course in addition to the petroleum reserve of thirty-two to thirty-five billion barrels.

Some gas companies have built up stores of natural gas in great underground reserves. Porous rock which either previously held gas or now contains water is required to store the gas. The gas is pumped into the area and stored there until needed.

Such reservoirs in the Maryland area could hold enough gas to supply the city of Washington for 3 or 4 months and would make the city independent of the single gas line on which it now depends for its daily use and would be invaluable in case of war or emergency, it was explained.

With the production of natural gas comes the natural gas liquids, consisting of natural gasoline (a light gasoline) and liquified petroleum gases such as butane and propane.

PUBLIC CONVENIENCE AND NECESSITY

Most enlightening was that testimony showing the part played by the Federal Power Commission in issuing certificates of public convenience and necessity for the construction and operation of natural gas facilities in interstate commerce.

A representative of the Commission stated that before any company can construct and operate such interstate natural gas facilities it must have a certificate issued by the Commission, explaining that section 7 of the Natural Gas Act states that no natural gas company shall construct or operate any facilities for the transportation or sale

of natural gas in interstate commerce unless there is in effect a certificate issued by the Federal Power Commission, which is the sole judge of whether natural gas should be used for one purpose or another, and where.

From 1942 until 1953, 996 such certificates were issued for 52,888 miles of line, with 3,882,568 additional compressor horsepower, at a total estimated construction cost of $3,886,141,970. It was estimated that construction costs for the period 1952–56 would involve $5 billion.

CONGRESS SHOULD ACT—GOVERNOR ARN

In connection with the activities of the Federal Power Commission, Governor Arn recommended that the Congress act at once to clarify its intent in the Natural Gas Act, and in so doing should specifically exempt from regulations of the Commission not only the physical operations of exploration and production, but sales by producers. He stated that the uncertainty that now exists as to ultimate disposition of the matter can only discourage the prospective investor in oil and gas exploration and drilling operations.

RESTRICTIVE POLICIES OF THE FEDERAL POWER COMMISSION

Mr. James E. Pew, manager, Natural Gas Division, Sun Oil, also objected to the Federal Power Commission procedures declaring that the manner in which they are being handled restricts the use of natural gas in some places for industrial purposes.

Mr. Pew said he was of the belief that in passing the Natural Gas Act the Congress intended the authority of the Commission to be limited entirely to controlling the transportation of gas in interstate commerce for the use of the utility which was buying it on the delivery end.

He pointed out further that natural gas was the one form of petroleum reserve being restricted by Federal law—building up in the ground as another burden for the oil industry and was causing the latter more trouble than all of the imports of petroleum because the reserves of petroleum as gas are being tied up by Government restrictions.

Mr. Jack Porter of Texas called the subcommittee's attention to a rather recent decision of the Supreme Court that the Federal Power Commission has the power and must exercise it to fix the price of natural gas at the wellhead. He warned that if this procedure is exercised by the Commission the discovery of gas reserves will decline and many small gas reserves will be passed up.

Mr. Porter expressed the opinion that no city should be allowed to go to a Federal commission and ask them to set a price on gas that might be produced in Texas or in any other State. Although the Commission has been fair in its hearings on the construction of gaslines, according to Mr. Porter, he sees no reason why a commission to regulate the use of gas is needed any more than a commission to regulate the marketing of coal or oil.

Many of the States have enacted minimum gas price laws in certain fields to reduce or prevent waste and to eliminate certain inequities existing prior to passage of these laws. Prices established under these laws are less than the current competitive prices in the areas involved for new gas contracts, and therefore cannot be considered excessive.

The effect of the minimum price laws has been to bring the price of gas more in line with the price of other fuels on a B. t. u. basis. The effectiveness of these regulations in the Hugoton Gas Field in Kansas and Oklahoma, the largest known gas reserve in the world, has been demonstrated by the large additions to the reserves in that area in 1953, according to Governor Arn, who explained that minimum price regulations must be tailored to fit specific areas, and therefore can best be effected through State rather than Federal action.

COMPETITION OF GAS WITH COAL AND OIL

As expected the competition of natural gas with other fuels was brought up during the hearings. The postwar expansion of both natural gas and diesel-powered locomotives have taken important markets from both coal and heavy fuel oil and the market for domestic heating coal is fast disappearing.

The National Coal Association pointed out that the Federal Power Commission has recognized the problem in several decisions denying authorizations for use of natural gas for inferior purposes, such as burning under boilers.

The association maintained that the Congress has the necessary power to compel observance of the principles of conservation in view of several Supreme Court cases upholding the constitutionality of the Natural Gas Act. It seems almost incontrovertible that the Congress has the power to legislatively guarantee the conservation of natural gas if the Federal Power Commission should fail to give full recognition to its duty in this field, in view of the Court decisions, according to the association.

The association further recommended that legislation was necessary to prevent "economic dislocation, unemployment, or injury to any segment of competing fuel industries of the United States" at the hands of foreign natural gas, if we are to survive in a predatory world.

COAL—GENERAL

Estimates given the subcommittee by Government witnesses indicate that the availability of presently known "recoverable" reserves of coal in the United States and the Western Hemisphere approximate 1,213 billions of short tons, or a 2,000-year supply on the basis of production and consumption during the period 1948–52.

Therefore there is no question but that the Western Hemisphere as such is self-sufficient in coal as far as quantity is concerned; however, as far as ready availability is concerned there are many qualifications to self-sufficiency. These qualifications turn on such vital factors as: (1) Wide differences in the dispersal of the reserves (the great preponderance being in the United States); (2) quality differentials in the adaptability of the coals of the respective nations in the hemisphere for metallurgical purposes, such as the production of coke and steel; (3) cost of production, including methods of mining and labor availabilities; (4) availability and costs of transportation from points of production to principal markets of consumption.

Regarding the availability of metallurgical coal referred to in No. 2 above, the Bureau of Mines pointed out that the high grade reserves in the upper Appalachian regions are seriously depleted.

PROBLEMS ENTERING INTO FACTORS OF COAL RESERVES

There are three factors where there may be some question with regard to future self-sufficiency of coal in the Western Hemisphere: (1) Continuity in availability of adequate supplies of the better grades of metallurgical coal; (2) having a going industry big enough to meet any sudden or rapidly increased demands of a serious national emergency; (3) composite problem of cost of production, transportation and quality of coal in the other nations of the Western Hemisphere or of coals which must be exported from other nations of the Western Hemisphere or of coals which must be exported from the United States to those nations in quantities sufficient to meet their normal economic requirements plus any accelerated demands to meet emergency needs.

The Bureau called attention to the fact that coal mining today has been concentrated on our best and most easily mined coals. There is no question but that coking coals of lower grade will have to be used in future mixtures of low-volatile coal. The decline in reserves of high grade and coking coals has accentuated the importance of blending poorer coking coals with rich coking coals for the production of metallurgical coke.

In continuing with the problems of the coal industry the Bureau stressed that because of the time that it takes to develop new coal mines or to rehabilitate older ones, including not only the normal time problems but also the difficulties of obtaining mining machinery, underground steel rails, stripping equipment, and many other items that are made of materials of strategic value, consideration must always be given to the ability of the coal industry to meet any sudden, or heavily increased demands of a national emergency.

CHEAP PRODUCTION DISAPPEARING

Another important problem in rapidly increasing coal production is the lesser availability today of readily strippable coal reserves than were available in the early days of World War II.

Witnesses stated this brings up the question as to the promptness with which the coal industry can substantially increase its production in the event of a national emergency. This will be determined to a great extent by the degree to which coal producing facilities are closed down because of losses of markets between now and the time of such an emergency; also on the availability of transportation equipment, principally open-top cars.

The subcommittee was shown a chart indicating that in the 5-year period between 1926 and 1930 coal supplied 66 percent of the total energy consumed in the United States. Except during the war years there has been a steady decline to a low of 33.4 percent in 1953.

DISTRIBUTION SYSTEM BIG FACTOR IN TIME OF EMERGENCY

Mr. Morris Schreiber, speaking for the Eastern States Retail Solid Fuels Conference, stated that coal distribution is the big question, especially in case of another great emergency. He warned that unless the coal industry is kept in a strong and virile condition, both from the distribution and production standpoints, the industry will be unable to meet demands in another emergency.

Similar views were expressed by Mr. Frank W. Earnest, Jr., speaking for 70 percent of the total anthracite production. He pointed out that the coal industry has been called upon only when emergencies arose and in another year the industry might not be around to pick up the load.

He strongly recommended that the subcommittee consider how the entire natural resource question can be resolved. He said the industry does not desire subsidies or Government interference but feels that the oil industry should pay more attention to the mobile end, and for the overall good of this Nation, give more consideration to keeping the coal industry strong.

PROBLEMS OF THE COAL INDUSTRY

It was pointed out by Mr. Pickett of the National Coal Association that coal can be produced with great efficiency and economy. It can be produced in abundance to provide for most of this Nation's demands for fuel energy, whether in peacetime or wartime, provided it is protected from unfair and subsidized competition from foreign sources which is seriously threatening the ability of the coal industry to continue the enviable record which it made during three previous wars in powering the Nation.

The problems of the coal industry are many and varied. One of these is set forth in an article, There's Coal in Your Future, written by officials of the Pittsburgh Consolidated Coal Co., the world's largest producing unit:

In case of an all-out war the industry would be called upon to supply energy equivalent to 200 million tons more than the current production, which would require the opening of 100 more mines at an expenditure of between $700 million and $1 billion.

EMERGENCY EXPANSION EXPENSIVE AND TIME CONSUMING

Transportation is another difficulty. Currently 80 percent of the American coal output moves by rail. On this basis the additional rail transportation of the additional 200 million tons required to supply a doubled energy load would make necessary approximately 235,000 open-top coal cars. It is safe to assume that in time of emergency, with other essential industries also needing necessary scarce materials, the railroads absolutely could not in a space of a comparatively short time obtain enough equipment to supply this additional transportation requirement.

It was also pointed out that in order to construct a new mine approximately 2 to 3 years are required. When existing mines are allowed to become idle, reconditioning for production takes from 1 to 1½ years. Mines become flooded when left idle. In many cases reconditioning might cost as much as beginning an entirely new operation.

IMPORTS AFFECTING COAL

Administrator W. F. Hahman of the Defense Solid Fuels Administration definitely stated that heavy residual fuel oil as such, not considering crude oil, competes directly with bituminous coal production. He stated further that while the oil people point to the loss of the railroad fuel market and other factors as being the reason that the

coal industry is suffering rather than the imports of heavy fuel oil, these facts are not borne out by the record.

This witness claimed that this loss was not critical to the coal industry because railroad fuel has been furnished by mines scattered throughout all the country and railroads normally bought from mines on their own lines if they had coal producing lines, and if not, they bought from offline mines, but generally within the area of the railroads.

Mr. Hahman stated that imports are not spread throughout the country, but are concentrated along our Atlantic coast. This market is one that has been served almost exclusively by solid fuel, from coal mines in Pennsylvania and West Virginia, and these have been hurt pricewise as they could not compete.

QUANTITATIVE LIMITS ON IMPORTS

The National Coal Association declared that the coal industry is willing to fulfill its obligation, providing it is permitted to maintain an economic climate, which would involve the protection of this industry from unfair competitive handicaps. One of the major handicaps, as reported previously, of course, is imported residual oil. On October 21, 1953, the association adopted a resolution urging the Congress to provide for an adequate quantitative limitation on imports of foreign residual oil.

The association stated that a tariff is not altogether the answer to their problem, that a tariff of as much as $1 or $1.50 per barrel could be absorbed by the importing companies without any significant change in the market situation.

The United Mine Workers reminded the subcommittee that the United States cannot permit the importation of greater quantities of goods than our market can absorb without affecting employment opportunities, purchasing power, internal revenue, and the tax status of all citizens in relation to the Government.

COAL RESEARCH

Officials of the Bureau of Mines stressed the vital importance of continuing research, both technological and economic so that we may be prepared to meet not only sudden shifts that may occur in the pattern of availabilities as compared to demands, but also that we may develop greater efficiencies and new methods of production and utilization.

The importance of continued technological research in the blending of coals for the production of good metallurgical coke, was stressed, and in this connection it was stated that such a procedure is a first essential to supplement a thorough reappraisal of mineable coking coal reserves.

Dr. A. C. Fieldner, Chief of the Petroleum and Natural Gas Division, Bureau of Mines, stated that even though the time may not yet be here to build commercial synthetic petroleum plants, yet we should be doing more and more research to make these processes cheaper, and ready to build when required.

He explained that two processes have been developed in Europe:

HYDROGENATION

(1) Hydrogenation—depends on forcing gaseous hydrocarbons into the coal molecules and making liquid molecules out of it like petroleum. Coal has 5 percent hydrogen and about 14 percent petroleum. This is rather a simple process. At the same time that liquid fuels are made, certain organic chemicals in the aromatic series, phenols and tar acids that are very useful for making plastics, are also produced. Some of these chemicals never before were made commercially and research is being conducted to find uses for them. Byproducts make this process profitable although it will not work on anthracite or low volatile coal.

GAS SYNTHESIS

(2) Gas synthesis—In this method the coal is gasified. First coke is made and from the coke water gas is manufactured. In the brown coal fields a char is made from the brown coal and this is gasified by a water gas process making carbon monoxide and hydrogen, which can be reacted when heated to the proper temperature with a catalyst to make hydrocarbons. There are also chemical byproducts in this process, such as alcohols and organic acids.

Not much was done with either of these processes until World War II when there was concern about sufficient gas and diesel oil because of the German submarine threat. This led the Congress to pass the Synthetic Liquid Fuels Act in 1945, thereby giving sufficient money to go on to pilot plant work and build so-called demonstration plants. One was built for each process.

The United Mine Workers expressed a deep interest in the coal-research program, especially experimental hydrogenation plants in Louisiana and at Rifle, Colo., naturally realizing that the huge loss of coal markets make it imperative that new ways and means be found to use coal.

HELIUM

Helium is a minor constituent of natural gas in a number of fields in the Southwest. It is a very scarce resource inasmuch as only a few fields contain gas of adequate helium content, and of adequate pressure and volume to permit production of helium at reasonable cost.

The first full-scale helium plant was started near Fort Worth, Tex., in 1921. In 1925 Congress passed an act placing responsibility for helium production and conservation in the Bureau of Mines.

The Bureau built a plant near Amarillo, Tex., which met the needs until World War II.

Until the beginning of World War II the demand was low, with the highest annual production in the fiscal year 1932, when the Amarillo plant produced about 15 million cubic feet, and during the 3 years preceding World War II the demand was down to a level of about 5 million cubic feet a year. To meet the demands of World War II additional plants were built in Texas, Kansas, and New Mexico, and the rate of output was increased to 137 million cubic feet in the fiscal year 1944.

After World War II the demand fell off to about 50 million cubic feet a year. With hostilities started in Korea the demand increased rapidly and in the fiscal year 1952 the demand rose to the peak of World War II. In 1953 the demand rose well above that peak to

152 million cubic feet and the demand for the current year is of the order of 200 million cubic feet, and that for 1955 even higher.

With the 1953 demand of 200 million cubic feet it was felt that with transportation facilities being what they were, the best production that could be reached would be 166 million cubic feet, thereby bringing the first shortage of helium since 1929.

Because of this shortage the Bureau is attempting to obtain more tank cars and is developing plans to increase plant capacity.

STRATEGIC USES

Bureau of Mines witnesses stated that although "lighter than aircraft" still take the largest proportion of the production, helium is essential to many of the activities of the military service, the Atomic Energy Commission (second largest Federal consumer) and defense contractors.

Helium cannot be stockpiled economically above the ground because of the cost of containers.

Overall the Government is the main consumer of helium, even with expanded production, and much of the demand is for national defense. In order to conserve this vital material the Bureau has secured long-term leases on the Southwest gas fields, and has adopted a policy of extracting helium from privately owned gas and thus endeavors to leave the Government gas in the ground as a reserve for future emergencies.

Questions may be asked as to why the Government is in the helium business and why is the Government the only producer: The answers: (1) Conservation—the relative scarcity of the resource; (2) the Government is still paying for about 85 percent of the helium production.

It was pointed out that while non-Government purchasers are taking about one-third of the helium production, much of this is going into Government contracts. However, there is presently pending a bill S. 3198 to grant the Secretary of the Interior power to dispose of surplus helium.

Questions of Policy

FEDERAL GOVERNMENT VIEW

In considering an oil policy the Bureau of Mines suggested that we must look at the worst side of the picture, and that would be a complete cutoff from foreign oil.

STATES GOVERNMENT VIEW

Without question those witnesses appearing before the subcommittee representing individual States are disturbed over the difficulties which must be met by the petroleum industry, although they expressed confidence that, given the facts, the Congress will come up with decisions which will alleviate to a great extent the problems at issue.

The Colorado representative, Mr. Downing, said he felt the subcommittee's study was of basic importance to the national welfare and security which is so dependent upon ample supplies of petroleum,

the future availability of which depends in a large measure upon the soundness of our national policies relating to oil and gas production.

LABOR VIEWPOINT

Some interesting points were brought out by Mr. John T. Jones of the United Mine Workers. Quoting the president of the union, Mr. John L. Lewis, Mr. Jones said that the internal buying power of the United States must be equal to 90 percent of its total production—the other 10 percent being exported.

No nation can buy from this country any more than they can find the value wherewith to pay, either in coin, or in kind. Under our foreign policy, with aid being given to stricken nations and others, the productive capacity of these nations is being increased for the type and character of goods which they are qualified to produce.

In addition, many nations have been aided in creating and building industries which did not previously exist in those countries before the last major conflict. But the money we have spent has not increased the standards of living of these countries.

The United Mine Workers declared that the millions spent in South America since World War II have not reached the pocketbooks of the population whose buying power is so badly needed, but instead have enriched those who already are in a comfortable position. Saying that every country we have rehabilitated is increasing its production with facilities they acquired by the help of our Government, the United Mine Workers asked, "What is to become of these goods?" Obviously, they asserted, because the standard of living of their population has not been raised, they do not have the buying power in order to maintain that increased quantity of production so they are going to seek markets, and they are going to sell in the world markets at any price that will move these goods because they have no other alternative. It means that American goods will be frozen out of these markets.

LABOR STATES CONGRESS SHOULD ACT

The United Mine Workers stated that the Congress should define a national policy, maintaining that an anti-American feeling is being engendered and does exist to a marked degree in all of South America, in Latin American countries and elsewhere throughout the world.

It was explained that the coal industry should have been exporting 50 million tons of coal in 1953 instead of the fraction of that amount which was exported, pointing out that it would make the difference of many millions of dollars of revenue to the Government in the form of taxes.

Regarding such exports, it was pointed out that we have given financial aid to Italy, France, Yugoslavia, and the Low Countries and they took that money to buy Polish and Czechoslovakian coal. Japan doesn't have metallurgical coal of any great value but they have a steel industry.

There is no reason why she could not get coal from the United States but instead we furnish her money with which she buys Manchurian coal from the Russians.

The United Mine Workers also pointed to the case of Pakistan, which at the time when Congress was sending them 1 million tons of

wheat because they were destitute, was building a merchant marine with our money.

In South America, as well as other parts of the world, foreign interests are working to discredit American enterprise, methods, goods, and diplomacy, and are building up a hostility to American goods, the United Mine Workers declared.

TARIFF

The question of tariff policy cropped up time and again throughout the hearings and in this connection Governor Kennon said he realized the problem of keeping the so-called free world workmen, especially in Western Europe, making a living and happy enough so they will not embrace communism, but he doesn't feel that setting a reasonable American tariff is going to make the difference in the choice between freedom and communism.

Governor Kennon maintained that the policy decision on tariffs should lie with the Congress, feeling that perhaps the executive would be in a better position in its dealings with foreign countries, to be in a position to say that:

> The responsibility for setting tariffs is with the Congress, and as much as we would like to be as friendly as possible with you, we have to conform with the laws of our land.
>
> If our trade relations with you develop as we hope they will, no doubt Congress in due course will recognize that and give concessions that are appropriate.

RESPONSIBILITY WITH CONGRESS

Mr. Downing stated that the responsibility for a policy with regard to our public lands and natural resources should be with the Congress, that foreign trade is the primary responsibility of the Congress and should be so regulated as to encourage the development and use of our natural resources.

Continuing, Mr. Downing stressed that in the national interest, some action must be taken to prevent an excess of petroleum products from entering our country in such amounts as will destroy our domestic industry. He recommended that the petroleum industry should work out a program to effect this purpose, with the aid of the Federal Government, and, failing in this manner to find a proper solution, the only alternative remaining would be legislative action to affectuate the established and accepted industry policy as to petroleum imports.

The theme followed by all of the witnesses representing the small producers was that every possible step should be taken to preserve a strong, domestic industry, that while imports were permissible to a certain degree, they should "supplement" but not "supplant" domestic production.

PICTURE HAS NOT CHANGED

In this connection the 1949 National Petroleum Council report stated:

> The national security and welfare requires a healthy domestic oil industry. Continuing supply to meet our national oil needs depends primarily on availability from domestic sources.
>
> Due consideration should be given to the development of foreign oil resources, but the paramount object should be to maintain conditions best suited to a healthy domestic industry which is essential to national security and welfare.

The above report recommended that implementation of an import duty policy should be flexible so that adjustments may readily be made from time to time on the basis of fair and reasonable competition, warning that "Imports in excess of our economic needs, after taking into account domestic production in conformance with good conservation practices and within the limits of maximum efficiency rates of production, will retard domestic exploration and development of new oil fields and the technological progress in all branches of the industry which is essential to the Nation's economic welfare and security."

Summarizing the problem of developing our national petroleum resources, the report stated:

> The petroleum industry is on record as agreeing that the paramount objective of national oil policy should be to maintain conditions best suited to a healthy domestic industry which is essential to national security and welfare, and that imports should supplement United States oil production, in a fair and reasonable equitable relationship to United States oil demands.

CAN'T BUY FRIENDSHIP

Mr. Porter raised the point relative to foreign trade that there was a school of thought in this country that believes the United States can buy friendship. He voiced the opinion that good relations cannot be bought with dollars or with trade, that the latter will continue if it is mutually advantageous.

The witness stated that, based on his experience with the State Department's handling of the so-called reciprocal trade agreements, he would much prefer the Congress as it is closer to the people reassuming its control over trade policy through its established agency, the Tariff Commission, on the basis of fair and reasonable competition.

He maintained that there is no question but that the State Department has encouraged development and importations of foreign-produced crude oil and suggested that if the problem isn't corrected by law it won't be corrected at all.

In reply to a question by the chairman that he was unable to understand how some of the main labor organizations differed on so-called reciprocal trade policy, the United Mine Workers pointed out that this was true also of the President's own Cabinet. To back up this statement a portion of a speech made by the Secretary of Commerce in New York on November 16 was quoted as follows:

> I am willing for American industry to face the competition of any industry anywhere with respect to all save the labor factor. I am not, however, willing to have American industry compete at the expense of the standard of living of American labor.

The chairman pointed out that the Secretary of State had expressed a willingness to set up schools to teach displaced workers a new trade, and would try to place national defense industries in areas rendered critical through imports.

BIG INDUSTRY—INTERNATIONAL VIEWPOINT

Our attitude of big industry was summed up in the recommendations made by Mr. J. W. Foley, vice president of the Texas Co., for a "clearly defined and continuing policy": (1) Continue to develop domestic resources and hold in reserve sufficient producing capacity to meet the estimated emergency requirements of the Government;

(2) maintain, develop, and increase American-owned foreign reserves throughout the free world, keeping the domestic market open to foreign oil in order that there may be continuous production to relieve shortages here and elsewhere; (3) avoid congressional or other governmental action that would restrict or penalize imports by arbitary import quotas, additional tariff levies or other artificial devices; and (4) support international trade policies which assure equal treatment to all nations, free of all discrimination and completely devoted to the national interest of the United States rather than the individual desires of any one industry or group.

Mr. Foley stated that we need a healthy domestic industry but declared that we need an equally healthy American-owned foreign oil industry, that the balance between the two might at times appear to be uncertain, but the free play of economic forces is a far better balance wheel than governmental regimentation or control.

DEPLETION ALLOWANCE

Governor Arn stressed the importance of continuing the petroleum depletion allowance, regarding this provision as proper recognition of the exhaustible nature of oil and gas resources.

He stated that this provision acts to encourage the investment of risk capital in a search for new oil and gas reserves. Without percentage depletion, the chances of failure and mounting costs in the field of exploration would discourage this activity, according to the Governor. He said further that the record in Kansas of continued maintenance and building up of proved and developed oil and gas resources despite heavy withdrawals, could not have been made without the incentive which had been provided by percentage depletion.

Governor Arn definitely recommended that the Congress should not act to reduce the 27.5 percent depletion allowance.

Also discussing the depletion-allowance feature, the witness representing the Union Oil Co. explained that this practice allows producers to retain from their earnings a certain amount of money, before taxes, so that they can reinvest it and get additional oil reserves so that they can continue in business. He emphasized that percentage depletion is not a subsidy but simply a method to equalize the tax burden so that the industry can continue to explore for underground reserves.

One of the independent producers appearing before the subcommittee pointed out that traditionally 60 percent of the income from sale of oil has gone back into the ground to find more crude, and this is made possible by the depletion allowance.

It would certainly seem from public statements made by the President that he favors specific industrial tax relief. For instance, in his initial budget message to the Congress, he said:

> At present, companies are often not permitted to deduct currently for research or development expenses. This rule is especially burdensome to small concerns because large companies with established research laboratories can usually get immediate deductions. I recommend that all companies be given an option to capitalize or to write off currently their expenses arising from research and development work. Our tradition of initiative and rapid technical improvements must not be hampered by adverse tax rules.

Then again, in his Economic Report to the Congress on January 28, the President said:

> To stimulate the expansive power of individual enterprise we should take action—by revising the tax laws so as to increase incentives and to remove certain impediments to enterprise, especially of small business * * *.

Mr. Warwick M. Downing, chairman, Oil and Gas Conservation Commission of the State of Colorado, stressed that every possible step should be taken to preserve a strong domestic industry, that while imports were permissible to a certain degree, they should "supplement" but not "supplant" domestic production.

INTERNATIONAL MATERIALS CONFERENCE

This section on IMC is from the testimony of Congressman Martin of Iowa and from officials of the Department of State and from the Office of Defense Mobilization contained in hearings in part 4.

The resolution, authorizing the work of this subcommittee, specifically directed it to make "a full and complete investigation and study of the accessibility of critical raw materials to the United States during a time of war," and "to study and recommend methods of encouraging developments to assure the availability of supplies of such critical raw materials adequate for the expanding economy and the security of the United States."

Charges were made during the 82d Congress, that the International Materials Conference had curtailed the supplies of critical materials to the United States during the Korean War, that it had interfered with our stockpiling program, and that it had unduly restricted our civilian economy. The subcommittee was unable to find any evidence that the International Materials Conference had been authorized by any act of Congress. It accordingly decided to hold extensive hearings to determine the facts regarding the allegations made during the 82d Congress, and to recommend remedial action based on the testimony.

A complete review of the activities of the International Materials Conference was presented to the subcommittee by the Honorable Thomas E. Martin, a Representative from the State of Iowa, on October 21, 1953. Congressman Martin traced the origin of the International Materials Conference from the proposals to establish the International Trade Organization, which originated in the State Department before 1945. Congressman Martin, while serving on the House Committee on Military Affairs from 1939 to 1947, was particularly interested in the stockpile. He played an active role in the enactment of Public Law 117 of the 76th Congress, the first stockpiling law, enacted June 7, 1939, and subsequently in the development of Public Law 520 of the 79th Congress, signed into law July 23, 1946. This is our present stockpile law. It included a Buy American provision.

BUY AMERICAN ACT AND RELATIONSHIP TO STOCKPILE

When President Truman signed Public Law 520, he issued a statement [1] in which he said it was only because of the overriding importance of the act that he was able to overcome his reluctance in signing the bill with the Buy American provision. He said:

* * * there can be a serious conflict between those provisions and the foreign economic policy which this Government is actively pursuing.
* * * It is the policy of this Government to work for international action to reduce trade barriers. We have proposed to other countries a set of principles governing trade, and look forward to the successful conclusion of broad inter-

[1] Hearings, pt. 4, p. 4.

national arrangements embodying the essential principles of these proposals. Pending the conclusion of such arrangements, it is the policy of this Government to avoid taking measures that will raise barriers to trade or prejudice the objectives of the forthcoming discussions. We are asking other countries to follow similar policies.[1]

Congressman Martin indicated that, in 1946, very few Members of the Congress were aware of the set of principles proposed to other countries to which the President referred. These proposals were prepared within the State Department and presented for consideration "by the peoples of the world," in State Department Publication No. 2411, November 1945.[2] These proposals were the basis of the discussions at the London Conference to draft a charter for an International Trade Organization, held on October 15, 1946.[3] They finally emerged, after further meetings, in the so-called Havana Charter.[4]

Congressman Martin stated it is now quite apparent that the President's reluctance in signing Public Law 520 stemmed from the fact that its provisions were in conflict with the charter for the International Trade Organization, which the administration was then promoting.

SECOND ECHELON POLICYMAKERS

Representative Martin's testimony said that the policies advanced by elected and appointed officials are often formulated by second- and third-echelon career employees who, in many cases, are still following the concepts which led to the Havana Charter. These individuals [5] have been supporters of international commodity agreements, a form of international cartel, which negate American concepts of free competitive private enterprise. The testimony clearly showed that the International Materials Conference picked up the plans embraced in chapter VI of the Havana Charter. This makes it necessary to reconstruct the history of the Havana Charter to provide the background necessary to an understanding of the International Materials Conference.

It was because of the facts disclosed by Representative Martin, in his appearance before the subcommittee in October 1953, that subsequent hearings were held on January 5, 13, 14, 15, and 18, 1954, at which present career employees of the State Department, who had participated in the formulation of the International Trade Organization and in the operation of the International Materials Conference, were asked to appear before this subcommittee so as to develop their philosophy in greater detail. These individuals included Willis Armstrong [6] and John W. Evans, of the Office of International Materials Policy of the State Department; Edmund E. Getzin, metals and minerals staff of the State Department; and Frederick Winant, special assistant to the Assistant Director for Materials, Office of Defense Mobilization.

He stated it is significant that, while the war was still being fought, second- and third-echelon policymakers were busily planning the post-

[1] Hearings, pt. 4, p. 4.
[2] Ibid., hearings exhibit 3, pt. 4, p. 338.
[3] Hearings, pt. 4, exhibits 5 and 6, pp. 355 and 385.
[4] Ibid., hearings, exhibit 15, pt. 4, p. 711.
[5] Ibid., hearings, pt. 4, pp. 10, 120, 136.
[6] Hearings, pt. 4, pp. 69, 75, 103, 149, 191, 239.

war world in which the United States was to undertake to underwrite the economies of every other nation on the globe. Congressman Martin declared that these planners included Alger Hiss in the State Department, Harry Dexter White and Frank Coe in the Treasury Department, and many others who have appeared before the Senate Internal Security Committee and the House Committee on Un-American Activities.

PROPOSALS FOR "EXPANSION OF WORLD TRADE"

Their work resulted in the proposals for "expansion of world trade and employment," which emerged from the State Department in November 1945.[7] The proposals included:

1. Release from restrictions imposed by governments. This meant the abolition of all tariffs.
2. Release from restrictions imposed by private combines and cartels. This meant setting aside our antitrust laws and subordinating them to a United Nations body.
3. Release from fear of disorder in the markets for certain primary commodities. This meant intergovernmental commodity agreements.
4. Release from irregularity and the fear of irregularities in production and employment. This meant world full employment planned by a United Nations body.

Congressman Martin claimed that Proposal No. 3, if accepted, would have authorized intergovernmental commodity agreements, or Government cartels. This proposal became chapter VI of the Havana Charter, and it was also the basis for the International Materials Conference and for the recent Tin Agreement which the State Department finally repudiated on March 5, 1954. In other words, under these proposals we were to abolish private cartels and substitute Government cartels in their place.

INTERNATIONAL TRADE ORGANIZATION

Congressman Martin introduced exhibits which showed that the proposals also provided for the establishment of the International Trade Organization. On February 18, 1946, the Economic and Social Council of the United Nations agreed to sponsor an International Conference on Trade and Employment to formulate the State Department's proposals into an international treaty.[8] This Conference met in London in the fall of 1946. The agenda for the Conference were the proposals originally developed by the United States State Department, with one additional topic entitled "International Agreement Relating to Industrial Production." Out of this Conference emerged the point 4 program, the Marshall plan, and our subsequent foreign-aid programs.[9]

The hearings contain the Official Report of the United States Delegation to the First Meeting of the Preparatory Committee for the International Conference on Trade and Employment [10] and the Report of the First Session of the Preparatory Committee of the United Nations on Trade and Employment,[11] held in London in October 1946.

[7] Ibid, hearings, pt. 4, exhibit 3, p. 338.
[8] Hearings, pt. 4, exhibit 4, p. 11.
[9] Ibid, hearings, p. 11.
[10] Ibid, pt. 4, exhibit 5, p. 355.
[11] Hearings, pt. 4, exhibit 6, p. 385.

LONDON CONFERENCE (1946)

Testimony showed that the official report of the United States delegation to this London Conference in 1946 [12] stated that the Conference was opened by Sir Stafford Cripps. The report said:

> He stated it will be necessary for nations to give up some of their sovereignty in the economic field; that, in the opinion of the United Kingdom, the fundamental idea in this field was that it must be both the policy and the duty of each separate nation to provide for full employment and to avoid the "exporting" of unemployment; and finally, that although risks must be taken in the field of international trade, it would not be possible to divert trade from its old channels unless there was some assurance that new channels would be created.[13]

Representative Martin testified that this meant that the British Labor Party believed that we should give up our economic sovereignty; and that we should not protect American workers against unemployment through tariffs, as such action would export unemployment. The British, in turn, would not give up their empire preference system until we had created new channels of trade whereby they could export to us, enabling England to undersell American producers in our own market.

The report of the United States delegation to the London Conference included this statement:

> There was considerable discussion of the type of provision which should be included to cover governmental purchases of commodities not for resale. It was agreed that in making such purchases member governments should accord fair and equitable treatment to the commerce of other members. In the United States draft charter such purchases would have come within the scope of the most-favored-nation clause.

"Governmental purchases of commodities not for resale," of course, referred to purchases for the stockpile.

Representative Martin testified that this proposal, which was included in the United States draft charter, explained President Truman's reluctance to sign Public Law 520. If the charter had been accepted, it would have superseded our stockpiling law and the protection Congress intended for the American mining industry would have been nullified.

Representative Martin also pointed out that Prof. Clair Wilcox, the chairman of the United States delegation, believed that the principles and rules of international commerce should be so drafted that they would apply with equal force to all nations, regardless of their different types of economies. It was never explained how the same rules of economics could be made to fit capitalist, Communist, and socialist nations.

POINT 4—MARSHALL PLAN

Representative Martin also stated that this report anticipated point 4 by more than 2 years, and the Marshall plan was revealed 6 months before General Marshall announced this program at the Harvard commencement in June 1947.[13]

Following the London meeting, a meeting of the Drafting Committee for the charter of the International Trade Organization took place in New York under auspices of the United Nations, from January 20 to February 25, 1947.[14] Immediately following the close

[12] Ibid., hearings, pt. 4, p. 17.
[13] Hearings, pt. 4, p. 17.
[14] Ibid., hearings, pt. 4, exhibit 7, p. 509.

of this meeting, the Department of Commerce field offices conducted informal hearings on the proposed charter for an International Trade Organization. These hearings started February 25, and extended to March 12, 1947.[15] Testimony showed that active participants in these hearings included Willard L. Thorp, then Assistant Secretary of State; Thomas C. Blaisdell, Jr., then Assistant to the Secretary of Commerce for International Trade; and, among others, Mr. Willis Armstrong,[16] who played an important role in the International Materials Conference at a later date and who is still an officer of the State Department.

Shortly after the adjournment of the meeting of the Drafting Committee, the Senate Finance Committee opened hearings [17] on the International Trade Organization. William Taylor Phillips, Acting Chief, International Resources Division, State Department, appeared before the Committee. Senator Millikin raised numerous questions regarding intergovernmental commodity agreements. He asked for a definitive answer to the question as to whether proposed intergovernmental commodity agreements would be submitted to Congress for approval. Dean Acheson, the Acting Secretary of State,[18] advised Senator Millikin on April 15, 1947, that such agreements would be submitted and said:

> Insofar as such commodity agreements impose any obligations on the United States requiring legislative implementation in any way, it is the intention of the Department that they should be submitted to the Congress.[19]

Congressman Martin argued that in spite of this assurance from the Secretary of State that no commodity agreements imposing obligations on the United States would be accepted, without submission to Congress, the International Materials Conference, which the testimony alleged involved a multiplicity of such agreements, was established in December 1950 without any reference to the Congress.

A second preparatory meeting of the Conference on Trade and Employment was held at Geneva during the spring and summer of 1947.[20] John Evans, who later played a leading role in the International Materials Conference and is presently Director, Office of International Materials Policy, in the State Department, was a United States delegate to the Conference.[21] Prof. Clair Wilcox, who was then the Director, Office of International Trade Policy, Department of State, reviewed the summer's work at Geneva before the Boston Conference on Distribution, at Boston, Massachusetts, on October 21, 1947.[22] The purpose of his address was to endeavor to secure support rom the business community for the proposed International Trade Organization.

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

Attention of the committee was called to the fact that the principal result of this Geneva Conference was the General Agreement on Tariffs and Trade. The Congress was given the opportunity to

[15] Hearings, pt. 4, exhibit 8, p. 603.
[16] Ibid., hearings, pt. 4, pp. 606–607.
[17] Ibid., hearings, pt. 4, exhibit 9, p. 612.
[18] Ibid, hearings, pt. 4, exhibit 9, p. 615.
[19] Ibid., hearings, pt. 4, p. 20.
[20] Hearings, pt. 4, exhibit 10, p. 621; exhibit 11, p. 697; exhibit 12, p. 700; exhibit 13, p. 703.
[21] Ibid., p. 120.
[22] Ibid., hearings, pt. 4, exhibit 14, p. 705.

decide whether the United States should become a member of the International Trade Organization. Congress refused to accede to our participation. United States participation in GATT was never submitted to Congress, and it had no opportunity to express itself on this issue.

The report of the Commission on Foreign Economic Policy, under the chairmanship of Clarence B. Randall, released in January 1954, discussed United States participation in GATT as follows:

> The organizational provisions of the General Agreement on Tariffs and Trade should be renegotiated with a view to confining the functions of the contracting parties to sponsoring multilateral trade negotiations, recommending broad trade policies for individual consideration by the legislative or other appropriate authorities in the various countries, and providing a forum for consultation regarding trade disputes. The organizational provisions renegotiated in accordance with this recommendation should be submitted to the Congress for approval either as a treaty or by joint resolution.
>
> The General Agreement on Tariffs and Trade has never been reviewed and approved by the Congress. Indeed, questions concerning the constitutionality of some aspects of the United States participation in the general agreement have been raised in the Congress. This has created uncertainty about the future role of the United States in the general agreement. It would be appropriate if the organizational provisions of the agreement were submitted to Congress, after renegotiation in accordance with the principles stated above.[23]

HAVANA CHARTER

On November 21, 1947, the United Nations Conference on Trade and Employment opened at Havana, Cuba, with more than 50 nations participating. The deliberations continued through March 24, 1948. Out of this Conference [24] was born the so-called Havana Charter [25] for an International Trade Organization.

On April 28, 1949, President Truman submitted for the consideration of the Congress the Charter for an International Trade Organization, which had resulted from the Havana Conference. A year later, on April 19, 1950, the Committee on Foreign Affairs of the House of Representatives opened hearings on House Joint Resolution 236, providing for membership and participation by the United States in the International Trade Organization. Secretary of State Dean Acheson appeared before the committee and urged United States acceptance of the charter and participation in the proposed International Trade Organization.[26] The hearings were concluded on May 12, 1950. The Committee on Foreign Affairs refused to report favorably on President Truman's request for United States participation in the International Trade Organization, and no further congressional consideration was given to such participation. In December 1950, President Truman announced at a press conference that he would make no further request to the Congress for approval of United States participation in an International Trade Organization.

It is significant that while the International Trade Organization, which resulted from the United States State Department's proposals of 1945 and the meetings at London, New York, Geneva, and Havana, was never approved by the Congress, the United Nations has established agencies which are effectively implementing all of these proposals.

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[23] Report of the Commission on Foreign Economic Policy, p. 49.
[24] Hearings, pt. 4, exhibit 16, p. 779; exhibit 17, p. 967.
[25] Ibid, hearings, pt. 4, exhibit 15, p. 711; exhibit 19, p. 970.
[26] Hearings, pt. 4, exhibit 18, p. 965.

The United Nations' Economic and Social Council, immediately following the London Conference, adopted a resolution which stated that:

> With regard to intergovernmental consultation and action on commodity problems the Preparatory Committee recommended "that, insofar as intergovernmental consultation or action in respect of particular commodities is necessary before the International Trade Organization is established, the governments concerned should adopt as a guide the chapter on Intergovernmental Commodity Arrangements of the charter appended to the report of the committee." [27]

Although the charter was never ratified, the Interim Coordinating Committee for Intergovernmental Commodity Arrangements is operating in full force, to carry out the provisions of chapter VI of the charter. On April 30, 1954, the Economic and Social Council of the United Nations voted to establish a Permanent Advisory Commission on International Trade which is discussed further in this report. Furthermore, the Paley Commission, in the summer of 1952, stated [28] that even though we had not ratified the charter, we were bound to follow these provisions in view of the action taken by the Economic and Social Council of the United Nations.

It was further alleged that the United Nations has established a Restrictive Business Practices Committee, operating under the Economic and Social Council, which is attempting to write international antitrust laws which may, or may not, accord with United States concepts. GATT, the General Agreement on Tariffs and Trade, another direct result of these United States proposals to the peoples of the world, is operating without congressional approval. It was established at the Geneva meeting of the Preparatory Committee. Subsequent meetings at Torquay, England, and Annecy, France, reduced United States tariff barriers on many commodities to levels where they afford United States producers little or no protection. According to the testimony, we have gone a long way toward implementing the other proposals through our foreign aid and technical assistance programs, as well as the technical assistance programs conducted by the United Nations.

The testimony alleged that the ideas, which originated in the lower echelons of the State Department, persisted despite congressional disapproval. There can be no question that all of these programs originated in our own State Department, and were adopted in one form or another by the United Nations.

DEVELOPMENT OF INTERNATIONAL MATERIALS CONFERENCE

Representative Martin, in his appearance before the subcommittee on October 21, 1953, reviewed the development of the International Materials Conference and explained its operations entirely from documentary sources which were generally available to the public.

The subcommittee subsequently received testimony from officials of the State Department and the Office of Defense Mobilization on January 5, 13, 14, 15, and 18, 1954. The subcommittee also examined documents in executive session, including classified material, which completely corroborated Representative Martin's testimony. At the January hearings, testimony was received from Willis Armstrong and

[27] Ibid., hearings, pt. 4, exhibit 4, p. 13.
[28] Ibid., hearings, pt. 4, exhibit 34, p. 1101.

John W. Evans, Office of International Materials Policy, Economic Affairs Division, Department of State; Edmund E. Getzin, Metals and Minerals Staff, State Department; and Frederick Winant, Special Assistant to the Assistant Director for Materials, Office of Defense Mobilization. These individuals are the principal present Government employees who were associated with the activities of the International Materials Conference. The State Department personnel also played an important part in the development of the International Trade Organization. These hearings were also attended by Donald B. Lourie, then Under Secretary of State (for Administration); Thruston B. Morton, Assistant Secretary of State for Congressional Relations; and Samuel Waugh, Assistant Secretary of State for Economic Affairs.

Following is a review of the history of the ITO presented to the subcommittee by Congressman Martin:

FIRST NOTICE OF INTERNATIONAL MATERIALS CONFERENCE

The International Materials Conference first came to public notice in a press release issued by the Department of State on January 12, 1951.[29] This release announced that the United States, the United Kingdom, and France were establishing an organization to deal with materials in short supply, and that other countries would be asked to participate in this organization at a later date.

A subsequent release from the State Department on February 21, 1951,[30] announced the formation of commodity committees which would make special recommendations concerning specific commodities. The release announced the formation of six such committees:

(1) Copper, zinc, and lead.
(2) Sulfur.
(3) Cotton.
(4) Tungsten and molybdenum.
(5) Manganese, nickel, and cobalt.
(6) Wool.

A seventh committee was subsequently formed to deal with wood products, including pulp and paper.

On February 24, 1951, the State Department, in a further release,[31] announced that these commodity groups would be known as the International Materials Conference. The release also announced the formation of a central group with overall responsibilities for the guidance of the individual commodity committees.

The following countries ultimately were members of the Central Group:

The United States
The United Kingdom
France
Canada
Italy
India
Brazil
Australia
The Organization of American States
The Organization for European Economic Cooperation

It is necessary at this point to trace the steps which led to the formation of the International Materials Conference, which was first

[29] Hearings, pt. 4, p. 24.
[30] Hearings, pt. 4, exhibit 20, p. 25.
[31] Hearings, pt. 4, exhibit 21, p. 26.

announced to the public by these three releases of the United States Department of State.

If the charter for the International Trade Organization had been approved, an International Materials Conference may not have been necessary. Chapter VI, article 57, subsection F, of the Havana Charter, provided that the International Trade Organization had powers "to assure the equitable distribution of a primary commodity in short supply." [32] Thus, if the charter had been approved it would have been possible for member governments to have dealt with shortage problems without any further congressional action. Despite the disapproval of the charter, the State Department, without congressional sanction, according to Congressman Martin, proceeded to organize the International Materials Conference to implement chapter VI of the Havana Charter and to establish what it considered an "equitable distribution" of commodities in short supply.

In the fall of 1950, prices of primary commodities rose markedly and difficulties were experienced in meeting the requirements of our military forces, the stockpile, and the civilian economies of the other nations of the free world.

MEETING WITH PRIME MINISTER ATTLEE

The testimony shows [33] that President Truman met with Prime Minister Attlee of the United Kingdom at a meeting in Washington to discuss the shortage problem. The British [34] asked for immediate relief on their shortage of sulfur, cotton linters, copper, and zinc. They showed that only 70 percent of a lowered requirement for zinc seemed to be available.[35] A substantial number of high officials of both Governments participated in these discussions. Among the suggestions made by the representatives of the United Kingdom was that the United States should curtail its stockpiling of commodities in short supply. This suggestion was made even though our forces were then under great pressure from the Chinese who had recently entered the Korean war. There was a great likelihood that the fighting would spread and the United States stockpile would then constitute the first line of defense—not only for the United States, but for our allies as well.

The testimony revealed that a memorandum had been written by Willard L. Thorp, Assistant Secretary of State, reporting the results of this meeting. It said that the Stockpile Report, a secret United States document, had been shown to the representatives of the United Kingdom at this meeting. The Stockpile Report specifically is marked with the notation "Secret—not releasable to foreign nationals." The use of this report at this meeting was apparently a serious breach of United States security regulations. It appears that representatives of the United Kingdom had requested that we reveal our stockpile-purchasing program in discussions with NATO countries.[36]

[32] Hearings, pt. 4, p. 109; exhibit 15, p. 748.
[33] Hearings, pt. 4, p. 90.
[34] Hearings, pt. 4, p. 165.
[35] Hearings, pt. 4, p. 114.
[36] Hearings, pt. 4, p. 114.

UNITED STATES STATE DEPARTMENT INITIATED INTERNATIONAL MATERIALS CONFERENCE

The testimony cites the fact that prior to President Truman's meeting with Prime Minister Attlee,[37] the State Department prepared a document for the guidance of the President [38] in which it summarized the position of this country and its impressions of the views of the United Kingdom. This position paper indicated that the United States State Department was furthering allocations even before the meeting of President Truman and Prime Minister Attlee. The following is taken from the testimony:

Senator MALONE. Apparently this document was prepared before the President met with Attlee, and said the United States is initiating steps toward international control of certain materials produced and consumed globally. * * * I will ask you the question if this does not clearly indicate that the initiative for international allocations arose in our own Department of State. I would like to have a direct answer on that.

Mr. EVANS. I think that the initiative so far as the United States Government is concerned probably did. I am not certain that that is so. I know that there were conferences of all the agencies concerned before the President met with Prime Minister Attlee.[39]

Another sidelight of this meeting is the fact that the State Department records that [40] the British believed "that international allocation would penalize rather than help the United States and the United Kingdom." The State Department's plans for international allocations, even before the meeting of President Truman and Prime Minister Attlee, are shown by other statements in the position paper, already referred to. It said:

The United States is also considering plans for special international conferences to deal with copper and zinc. The current cotton shortage has been the subject of considerable examination by the International Cotton Advisory Committee which includes nearly all producing and consuming countries.[41]

The United Kingdom should be requested to agree to the United States suggestion for the international allocation of tin and to the possible consideration of copper on the same basis.[41]

Also the United States is initiating steps toward international control over certain materials produced and consumed globally. We have sought cooperation from the commonwealth countries to assure adequate supplies of wool for United States military requirements. We are seeking a special international conference on rubber. We are considering the establishment of international allocations for tin and copper.[42]

In spite of the British reluctance to adopt international allocations, the United States State Department planners prevailed, according to the witness.

The position paper included the following advice to the President:

In reducing civilian consumption, minimum requirements essential to the operation of civilian economies here and abroad must be met. With respect to less essential civilian needs, the principle of equality of sacrifice, as among the United States and other free world nations, should prevail. As the United States is now operating at higher levels of civilian consumption than a number of other Western European countries, this may mean greater cutbacks in this country than in certain other countries.[43]

[37] Hearings, pt. 4, p. 206.
[38] Hearings, pt. 4, p. 202.
[39] Hearings, pt. 4, p. 207.
[40] Hearings, pt. 4, p. 113.
[41] Hearings, pt. 4, p. 209.
[42] Hearings, pt. 4, p. 206.
[43] Hearings, pt. 4, p. 203.

"EQUALITY OF SACRIFICE" CONCEPT

The subcommittee was told that, at a time when American forces were bearing the brunt of the fighting in Korea, the State Department was considering a plan of equality of sacrifice, which implied greater cutbacks in the production of civilian goods in this country than in other countries.

The State Department's desire to curtail United States civilian consumption more severely than that in other countries was also alleged in a supplementary document. It said:

> In cutting back civilian consumption, the minimum requirements essential to the operation of civilian economies must be met, and the principle of equality of sacrifice in relatively less essential activities should prevail. The United States can better afford to eliminate certain civilian uses of raw materials than can most of our allies, because the United States has a higher standard of living, more adequate supplies of consumer goods, and a wider range of uses of raw materials in less essential fields. Nearly all of our allies have been experiencing severe shortages of convertible currencies ever since World War II, and have been operating their economies in many respects on a minimum requirements basis, especially where raw materials from hard-currency areas are concerned.[44]

MUNITIONS BOARD OPPOSITION TO "EQUALITY OF SACRIFICE" CONCEPT

The document from which the above quotation was taken was submitted to the other Government departments for their comments. The Munitions Board's staff's comments on this memorandum contained the following statement:

> The term "equality of sacrifice" as applied to the United States in relation to other nations can be a most damaging application to the United States economy. Since the United States will be bearing most of the financial burden, if past patterns are a guide, we must also protect the United States economy. It is just as essential, if not more so, that the United States economy not be reduced or disturbed too severely.[45]

The soundness of the Munitions Board's position was indicated by subsequent events. The United States proceeded with international allocations and there was great dislocation in the economy and unemployment.

Representative Martin, in his testimony,[46] stressed the fact that the United States was faced with unemployment due to the International Materials Conference allocations. Proposals were later made to pay Federal unemployment compensation benefits from the Federal Treasury for those unemployed due to material shortages. Representative Martin said, "Obviously manufacturers with closed plants do not pay income- and excess-profits taxes." [47] Our national debt would not be as high today if the Government had been able to collect higher income and excess-profits taxes during the period of the Korean war from manufacturers who would have been happy to have paid such taxes if they could have obtained materials with which to operate their businesses.

The comments of the Munitions Board referred to above are also significant in that they show that the Munitions Board recognized the possibility of the United States stockpile being allocated a lower

[44] Hearings, pt. 4, p. 208.
[45] Hearings, pt. 4, p. 217.
[46] Hearings, pt. 4, p. 40.
[47] Hearings, pt. 4, p. 40.

priority than the civilian economy of the United Kingdom. The Munitions Board said:

> Agreement should be sought from the United Kingdom that raw materials which are made available for development of export trade will be controlled so that nonessential and luxury goods using scarce materials are eliminated or cut to a minimum. Also exports to Eastern Europe should not include scarce materials or end items containing such materials. Examples are molybdenum and exports of graphite crucibles using scarce Madagascar flake graphite.
>
> Defense needs should be predominant. It should be recognized that the United States is currently imposing controls on short-supply materials. Stockpiling is a United States and allied defense requirement and should take precedence over United Kingdom normal business-producing efforts.[48]

After the International Materials Conference became effective, the normal civilian business of other countries, including the United Kingdom, did take precedence over our stockpile, and the so-called "principle of equality of sacrifice" was adopted.

Despite this caution by the Munitions Board, the subcommittee found that an exhibit,[49] document No. 48, prepared by the Office of Defense Mobilization, providing general policy guidance for United States representatives on IMC commodity committees, included this advice:

> * * * ordinarily military requirements and directly supporting requirements come first, followed closely by a few highly urgent stockpile requirements. Next would come those civilian requirements necessary to secure essential production, prevent serious unrest, and promote effective civilian participation in basic defense goals of the free world. Most stockpile requirements would rank below military requirements and the most "essential" civilian requirements.[50]

STOCKPILE REQUIREMENTS ACCORDED LOW PRIORITY

It was claimed that the advice of the Munitions Board was disregarded, and the United States stockpile was accorded a lower priority than essential civilian requirements of other nations.

It was testified that the advice of the Munitions Board regarding the original concept of "equality of sacrifice" was also disregarded. The same document, No. 48, included this advice:

> In reducing or limiting nonessential civilian consumption through control processes, the principle of relative equality of sacrifice among countries should prevail; as regards exports from the United States, the application of this principle involves its use as a general criterion so as to bring about proportional reduction in nonessential domestic consumption, with adjustments to accommodate extraordinary and special circumstances in individual countries.[50]

Following the meeting between President Truman and Prime Minister Attlee, the decision was reached that some kind of organization would be established to deal with raw materials.

The President instructed [51] the Department of State to organize what became the International Materials Conference, The International Materials Conference was developed entirely within the State Department under a group headed by Willard L. Thorp, then Assistant Secretary of State for Economic Affairs.

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[48] Hearings, pt. 4, p. 219.
[49] Hearings, pt. 4, p. 303.
[50] Hearings, pt. 4, p. 305.
[51] Hearings, pt. 4, p. 89.

NO CONGRESSIONAL AUTHORIZATION FOR INTERNATIONAL MATERIALS CONFERENCE

Congressman Martin testified that no congressional authorization was ever requested by the President or the Secretary of State. When the question was first raised by Senator Ferguson as to the authority for United States participation in the International Materials Conference, the Congress was advised "There is no specific statutory authority for the participation of the United States in this conference, as it is one of the many activities carried out in furtherance of the foreign policy of the United States."[52] There can be no question as to the President's power to negotiate with other countries in the furtherance of our foreign policy. As will be shown, the International Materials Conference established allocations of materials to the United States, which they called "entitlements for consumption." These allocations were implemented internally by using the powers granted the President by the Defense Production Act. There was never any intention that the powers requested by the President to strengthen our defenses, acquire a stockpile of strategic materials, and preserve our civilian economy would actually be used to operate an international cartel. This cartel conflicted with all the purposes of the Defense Production Act. According to the testimony the Congress had no basis for such an assumption, in view of the fact that the International Materials Conference so closely resembled the type of organization provided in chapter VI of the Havana Charter, which it had refused to accept.

Willard L. Thorp, then Assistant Secretary of State for Economic Affairs, described the operation of the International Materials Conference in an article, which appeared in the State Department Bulletin of August 13, 1951,[53] as follows:

> * * * Neither the central group nor the commodity committees have any charter or bylaws, but they are merely a group of responsible Government representatives gathered together to consider with each other what can be done to deal with whatever seems to be the immediate problems for their particular commodity.[54]

Testimony alleged that it was not the interest of the Congress to delegate the power exercised by the International Materials Conference to a group operating without a charter or bylaws.

Witnesses stated that it was the State Department that was primarily interested in the establishment of the International Materials Conference. It conceived it as a vehicle to continue the concepts which it presented to the peoples of the world in the proposals of 1945. The Korean emergency furnished a convenient means of reinstituting the concepts which the Congress had refused to accept.

The record contains a State Department internal memorandum, dated December 21, 1950,[55] written by Robert E. Asher to Edward M. Martin. Mr. Asher was special adviser to Mr. Martin, then Director of the Office of European Affairs. This memorandum indicates that the State Department not only designed the International Materials Conference, but intended to control its operations at all times. This memorandum also indicates that the International Mate-

[52] Hearings, pt. 4, p. 1070.
[53] Hearings, pt. 4, exhibit 22, p. 978.
[54] Hearings, pt. 4, p. 28.
[55] Hearings, pt. 4, p. 234.

rials Conference was designed to revive the concepts of chapter VI of the Havana Charter. Paragraph 8 of Mr. Asher's memorandum stated:

> Where there are existing commodity groups already in existence, as in tin, rubber, wool, and cotton, it is suggested that their terms of reference be reviewed to determine whether they are competent to recommend measures for increasing the production and facilitating the equitable distribution of the commodities with which they are concerned.[56]

This quotation is held by witnesses to be of great significance in that it confirms the fact that the originators of the International Materials Conference conceived it to be a means of achieving their long-term objectives; namely, the establishment of intergovernmental commodity agreements.

A letter from James E. Webb, Acting Secretary of State, to Secretary of Defense Marshall,[57] following the meeting between President Truman and French Prime Minister Pleven on January 29 and 30, 1951, stated the United States position. It said:

> United States position: We believe the most effective international action that can now be taken is to work out agreements for international allocation of raw materials in short supply and for coordination of domestic programs for reducing unessential consumption. Such agreements might also include the guaranty by producing countries of maximum prices, in exchange for similar guaranties of minimum prices. These arrangements would be worked out through the commodity committees described in paper 5/2. The United States has no present plans for dealing internationally with rising commodity prices except what may be accomplished through these commodity committees.[58]

Witnesses alleged this clearly shows that price fixing and long-term arrangements were contemplated in establishing the International Materials Conference.

When United States participation in the International Materials Conference was challenged in congressional debates in 1952, the State Department promptly attempted to shift the responsibility to the Defense Production Administration.

Mr. Armstrong, in his testimony before this subcommittee, said:

> * * * when the United States took any action in its own territory related to what the International Materials Conference recommended, it took that action under the authority of the Defense Production Act, but the basic authority to participate in the meetings and to negotiate with other countries was derived from the constitutional position of the President.[59]

Despite the attempt to shift the responsibility to other agencies, the record shows that the State Department, during the fiscal years 1951, 1952, and 1953, expended a total of $387,750 [60] of its own funds on the operation of the International Materials Conference. In fact, testimony showed that, during the fiscal year 1951, the State Department paid 100 percent of the expense of the International Materials Conference.[61] During the fiscal year 1952, the State Department paid 53.5 percent of the entire cost.[62]

Another State Department document, identified as Document No. 57, presented to this subcommittee, showed that State Department

[56] Hearings, pt. 4, pp. 230, 235.
[57] Hearings, pt. 4, p. 309.
[58] Hearings, pt. 4, p. 309.
[59] Hearings, pt. 4, p. 93.
[60] Hearings, pt. 4, p. 98.
[61] Hearings, pt. 4, p. 256.
[62] Hearings, pt. 4, p. 260.

personnel were placed at all vital points within the International Materials Conference to control its direction.

One member of the staff of the Office of International Materials Policy in the State Department is permanently assigned to the Secretariat of the International Materials Conference, where she acts as secretary of the Copper, Lead, and Zinc Committee

Since the IMC involves a series of negotiations with other countries, the State Department is represented on each of the interdepartmental committees which advise the United States representatives on the IMC commodity committees. It also is consulted by those representatives on daily problems which come up in the work of the committees. This requires almost the full time of five officers of the Office of International Materials Policy. One of these five officers has been designated by the Defense Production Administration as the United States representative on the Pulp and Paper Committee

In order to carry out their functions of effectively advising the United States representatives on the IMC committees, the officers in question require almost the full-time supervision of one of the senior assistants to the Director of the Office of International Materials Policy and part-time supporting work from a number of its other officers, plus the time of numerous officers in the regional bureaus of the Department required for consultation with OPM officers on IMC problems. The senior adviser to the Director of the Office of International Materials Policy above referred to also acts as adviser to the United States representative on the Central Group of the IMC and to the United States representative on the Inter-American Economic and Social Council where problems related to the work of the IMC frequently arise.

The chief function of the State Department's economic officers, in relation to IMC, is to keep officers of other agencies informed and advised of the relationship of overall United States foreign policy to the specific negotiating problems faced in the IMC committees, and to assist in negotiating with other countries so as to promote the national objectives of the United States. It is also the State Department's function, in other relationships with foreign governments, to keep before them a clear picture of the United States objectives in the field of materials policy.[63]

STATE DEPARTMENT CONTROL OVER INTERNATIONAL MATERIALS CONFERENCE

Representative Martin's testimony showed that while the releases of the International Materials Conference had a heading in three languages, designed to give the impression that they emanated from an international organization, the fact of the matter was that they were produced within the State Department. They carried the name of Frank Standley, a State Department employee, Office of Press and Public Relations, with the telephone number REpublic 5600, which was then the telephone number of the State Department.[64]

While the witnesses from the State Department stressed that the Defense Production Administration was the operating agency rather than the State Department, the internal reports of the Department showed that the State Department intended to keep a close rein on the controls.[65] A memorandum from Mr. Evans to Secretary Thorp included this significant statement:

One other loose end where I am afraid I need your help is a matter of State Department representation. You will remember that John proposed that the alternate United States member of the Central Group and individual committees be from the Department. It does seem clear that we must be in a position to follow very closely the negotiations in these committees.[66]

Shortly after Mr. C. E. Wilson, the Defense Mobilizer, came to Washington, he was joined by Mr. Fred Searles, an eminent mining

[63] Hearings, pt. 4, p. 229.
[64] Hearings, pt. 4, pp. 35, 40.
[65] Hearings, pt. 4, p. 95.

engineer. Mr. Searles was ostensibly in charge of all materials matters in the Office of Defense Mobilization. One of the documents produced before the subcommittee was a note from Mr. Evans to Mr. Leddy.[66] The substance of the note was a report that Mr. Evans had heard Mr. Searles disparage the necessity for international allocations and questioned whether any international action at all should be taken in the raw materials field. This letter asked whether the State Department had obtained Mr. Wilson's approval of the International Materials Conference. A penciled notation on the note said:

> Not necessary. President approved it. Whole thing decided before Wilson came in.[67]

Witnesses alleged the State Department was thus able to carry out its scheme for world controls.

ENTITLEMENTS FOR CONSUMPTION

Representative Martin, in his testimony, traced the operations of the International Materials Conference and showed how its "entitlements for consumption" lowered the American standard of living following the plan of equality of sacrifice already described. This adversely affected our defense effort.

The International Materials Conference issued its allocations of nonferrous materials, called "entitlements for consumption," on September 28, 1951.[68] They were designed to limit the amount of copper and zinc which the United States would be permitted to consume. The allocation and price control powers of the Defense Production Act were used to limit United States consumption.

UNITED STATES GOVERNMENT ADMINISTRATIVE AGENCIES IMPLEMENTED INTERNATIONAL MATERIALS CONFERENCE OBJECTIVES

Copper used domestically was allocated under the controlled materials plan, authorized by the Defense Production Act. Each fabricator and processor was issued tickets by the National Production Authority, entitling him to secure a given amount of copper. The National Production Authority was directed by the Office of Defense Mobilization to limit its issuance of controlled materials plan tickets to the level permitted by the International Materials Conference "entitlements for consumption."

United States consumption of zinc was controlled by using the powers of the Defense Production Act to set ceiling prices. The Congress granted these powers in order to control inflation and not to implement a scheme for international allocations.

On September 30, 1951, just two days after the International Materials Conference issued its "entitlements for consumption" for copper and zinc, the Office of Defense Mobilization established ceiling price regulations on lead and zinc.[69] The release by the Office of Defense Mobilization announcing these ceiling prices said:

> International allocations have already been accepted for zinc * * *. The establishment of a ceiling which is somewhat below current world prices involves the calculated risk of some decrease in imports * * *. This action will tend to reduce the pressure of United States demand on free world supplies, ease the

[66] Hearings, pt. 4, p. 210.
[67] Hearings, pt. 4, p. 211.
[68] Hearings, pt. 4, p. 29.
[69] Hearings, pt 4, p. 31.

problems of friendly consuming countries, and make any international allocation arrangement more effective.[70]

The regulations implementing this Office of Defense Mobilization order were issued by the Office of Price Stabilization [71] on October 2, 1951, just 4 days after the International Materials Conference established United States entitlements.

DIVERSIONS FROM STOCKPILE

By February 1, 1952, zinc was being taken out of the stockpile. Mr. C. E. Wilson, head of the Office of Defense Mobilization, was quoted in a New York Times dispatch as saying:

> Failure of zinc imports to reach normal volume was given * * * as the reason for diversion of the metal.[72]

Actually, the failure of imports to reach normal volume was not a surprise—"it had been planned that way."

The Pulp-Paper Committee of the International Materials Conference never established overall allocations, but it announced an emergency allocation of newsprint in a release dated June 24, 1951.[73] Under this allocation, newsprint was assigned to certain countries. The release said:

> As sufficient newsprint for this emergency allocation was not obtainable through normal trade channels, the newsprint allocated will be supplied from North American sources by diversion from contracts between Canadian and United States mills and publishers in these countries.[74]

Witnesses alleged that this was a wholly unwarranted interference with private contracts.

The Sulfur Committee of the International Materials Conference, on October 17, 1951, made its first allocation of sulfur.[74] In this instance, the United States was assigned an export quota of 240,000 long tons per quarter.[75] The sulfur was made available to meet this export quota by restricting domestic consumption through allocations, and by establishing differential price ceilings giving sulfur producers a higher price on exported material than they could obtain from domestic consumers.[76]

The Tungsten-Molybdenum Committee of the International Materials Conference issued its allocations for these materials in a press release dated July 6, 1951.[77] This committee again established a molybdenum export quota for the United States. This country is the principal producer of this vital strategic material. In the case of tungsten, it made allocations to all of the countries of the free world, and it also established maximum and minimum prices for tungsten.

It was testified this was the first attempt at world price fixing.

It is significant that Mr. Evans, when he appeared before the subcommittee on January 13, 1954, testified:

> * * * Of course, the IMC had no authority to fix prices * * *.[78]

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[70] Hearings, pt. 4, p. 32.
[71] Hearings, pt. 4, exhibit 23, p. 985.
[72] Hearings, pt. 4, p. 34.
[73] Hearings, p. 35.
[74] Hearings, pt. 4, p. 36.
[75] Hearings, pt. 4, p. 37.
[76] Hearings, pt. 4, p. 38.
[77] Hearings, pt. 4, exhibit 26, p. 991.
[78] Hearings, pt. 4, p. 126.

The action in setting tungsten prices clearly shows that the International Materials Conference did establish maximum and minimum prices, and if objections had not been raised by some producing countries, this trend would have gone much further.

While committees were established to deal with wool, cotton, and cotton linters, no allocations were ever issued.

The Manganese-Nickel-Cobalt Committee issued allocations which were implemented through the powers of the Defense Production Act. In fact, the allocations for nickel were only discontinued in the last quarter of 1953. Immediately thereafter, domestic controls on nickel were suspended. The present acute shortage of nickel results from the fact that, during the period of International Materials Conference operations, the nickel destined for the stockpile was diverted elsewhere to meet International Materials Conference "entitlements for consumption." The Office of Defense Mobilization is now restoring the United States stockpile of nickel.

It was stated that the State Department consistently attempts to give the impression that all the hardships and restrictions imposed on domestic consumers were the result of actions taken either by the Defense Production Administration or the Office of Price Stabilization. The limitation orders and price ceilings were issued at the direction of the Office of Defense Mobilization, and the witnesses testified that these orders were the direct result of instructions from the Defense Mobilizer to all agencies concerned to implement International Materials Conference allocations.[79]

On February 23, 1951, Gen. Lucius Clay, acting for the Defense Mobilizer, convened a special meeting to establish the duties and responsibilities of the United States representative on the Central Group of the International Materials Conference. A statement had been prepared for discussion at this meeting by General Clay. The State Department participated in this meeting through Mr. Harold Linder and Mr. John Evans.

General Clay explained that one of the purposes "was to avoid having agreements made by the United States in international commodity conferences and then not being implemented by the United States Government." This statement clearly showed that it was the intention to make binding agreements which this Government would carry out. The minutes of the meeting contained this statement. He (General Clay) explained that while the United States representative was from the Defense Production Administration, some of the agreements reached in the Conference would require governmentwide action for their implementation. The memorandum[80] which was discussed at this meeting included two significant paragraphs: Paragraph 1 provided that the United States representative on the Central Group of the International Materials Conference would participate in all the meetings of the Central Group to determine what additional material committees should be established. He would act for the Defense Production Administrator and would present the United States position after consultation with an executive committee of the United States Committee on Foreign Supplies and Requirements established for this purpose. Paragraph 6,[81] read as follows:

[79] Hearings, pt. 4, p. 173.
[80] Hearings, pt. 4, p. 171.
[81] Hearings, pt. 4, p. 172.

Sends recommendations of the International Materials Committee requiring further action by governments to the Director of the Office of Defense Mobilization to be placed in execution as far as United States responsibility is concerned. Generally, those recommendations that fall within the authority of the DPA will be handled directly by that agency.[81]

On July 19, 1951, Mr. E. T. Gibson, Acting Administrator of the Defense Production Administration, and also United States representative on the Central Committee of the International Materials Conference, wrote to Mr. Charles E. Wilson requesting that he approve the instructions he had prepared to the heads of certain executive departments and establishments to implement the Tungsten-Molybdenum Committee and Sulfur Committee allocations.[82] His letter said that these instructions were prepared in compliance with paragraph 6 of General Clay's memorandum. These instructions, which were sent to heads of certain executive departments and establishments, after approval by C. E. Wilson, Director of Defense Mobilization, contained the following statement:

* * * This Government is pledged to carry out its part of the recommendations contained therein. (The relevant export quota for molybdenum, already approved by the Secretary of Commerce, is consistent with those recommendations.)

In behalf of the Defense Production Administration, and as United States representative on the Central Group of the International Materials Conference under duties and responsibilities assigned by the Office of Defense Mobilization, I am therefore calling on United States executive departments and establishments to take the necessary actions to implement the recommendations in the attached document.[83]

OFFICE OF DEFENSE MOBILIZATION IMPLEMENTED IMC ALLOCATIONS

Having established the fact that the Office of Defense Mobilization was pledged to implement IMC allocations, the subcommittee heard repeated assertions by the State Department in its testimony that price controls or allocation controls, operated by other agencies, were the cause of whatever distress occurred in the United States during the period of International Materials Conference operations.

An instance is afforded by the following excerpts from the testimony of January 13 and 14, 1954:

Senator DWORSHAK. Do you think it was necessary for us to close down some of our industries and to take less than what might be acknowledged as a fair allocation of free world copper?

Let me simplify that. I do not want to put any words in your mouth. Do you think that we were getting all of the copper we were entitled to, even though we were forced to close down our auto production in Detroit at a time when apparently Britain and other countries allied with us were obviously getting all the copper they needed?

Mr. GETZIN. Senator, I would like to answer that in this way: I think the United States was allocated all the copper it was entitled to, but I do not believe the United States purchased all the copper which it had been allocated.[84]

Senator DWORSHAK. You are contending, then, that the IMC allocations were entirely fair to this country, but that because of the prevailing price ceiling of copper in this country, which was 24½ cents, our domestic processors apparently were not willing to buy that copper which had been allocated to the United States?

Mr. GETZIN. Yes.

Senator DWORSHAK. That would lead to the conclusion that it was the ceiling prices in this country that were partially responsible.

Mr. EVANS. Senator, may I say in that connection that that has been my conviction, on the basis of everything I was able to find out about the situation from

[81] Hearings, pt. 4, p. 172.
[82] Hearings, pt. 4, p. 173.
[83] Hearings, pt. 4, p. 173.
[84] Hearings, pt. 4, p. 124.

the time that this debate first started. Whether or not the allocation which the United States received under the IMC for copper was fair or unfair, that is always a difficult word to define.[65]

This testimony gave the impression that actions taken independently by the Office of Price Stabilization prevented American consumers from securing copper in world markets during the early months of 1952.

The committee was informed that copper was controlled by the issuance of copper tickets, and that manufacturers were unable to obtain extra controlled materials plan tickets to secure foreign copper, even though they were willing to pay world prices higher than the United States ceiling without any relief from the Office of Price Stabilization in the pricing of their own products.

As the testimony continued, it was pointed out that price controls and allocation controls were all under the same head, who was carrying out the directives originally agreed to at the Foreign Supplies and Requirements Committee meeting of February 23, 1951. The following is taken from the transcript:

Mr. WINANT. * * * On the copper just one more point: We ran short of copper but not because of the IMC allocation. There was a great debate on that. I wrote a rebuttal on it. Let's not go into that if you do not mind. It is in the record if you want it.

The point is that you had not only price control, but you had the controlled materials plan and copper was one of the three materials under the controlled materials plan. Our people could not buy the copper at that price and get it out to Detroit at say the Lincoln plant or wherever they wanted it. It was not the IMC that caused the United States copper shortage.

Senator MALONE. Who put on the controlled materials plan?

Mr. WINANT. Fleischmann, I would say, sir.

Senator MALONE. Is he the Defense Production Administrator?

Mr. WINANT. He is Administrator of Defense Production.

Senator MALONE. They ran the IMC, did they not?

Mr. WINANT. Yes, sir.

Senator MALONE. I think that is plenty of explanation.[66]

Despite the above testimony, Mr. Evans said:

Of course, the IMC had no authority to fix prices, and no authority to allocate, for that matter.[67]

IMC RESTRICTED UNITED STATES CONSUMPTION

It was alleged that the International Materials Conference restricted United States consumption, in accordance with the principle of "equality of sacrifice" originally proposed by the State Department. This resulted in sharp curtailment of the production of goods requiring copper and other IMC materials within the United States. In turn, this caused extensive unemployment.

In addition, the subcommittee was told that the International Materials Conference interfered in a wholly unauthorized manner with the acquisition of our strategic stockpile. The International Materials Conference, in its own publication, The Report on Operations, 1951–52, bluntly stated:

In developing plans of distribution for the metals it was necessary for the committees to consider what policy should be followed in allowing materials for stockpiling purposes during a period of scarcity. * * * The Copper-Zinc-Lead Committee and the Manganese-Nickel-Cobalt Committee decided, in connection with their fourth-quarter allocations, to recognize, in principle, the requirements

[65] Hearings, pt. 4, p. 125.
[66] Hearings, pt. 4, p. 187.
[67] Hearings, pt. 4, p. 126.

for strategic stockpile purposes; but, in view of the tight supply, they recommended a special allowance for such requirements in the plans for copper, zinc, and cobalt, only to the extent of a small percentage of consumption during a given base period. In the case of commodities where the shortage was more acute (nickel, tungsten, and molybdenum), the committees were unable to recommend any special allowance for stockpiling. In the allocation plans for the first quarter of 1952 the Copper-Zinc-Lead and the Manganese-Nickel-Cobalt Committees found it inadvisable to provide any special allowance for stockpile purposes.[88]

The subcommittee was informed that an informal group, operating without a charter or bylaws, decided to set aside the stockpile program authorized by the Congress and for which appropriations were made.

The Munitions Board, in commenting on the State Department's position paper in December of 1950, said:

Although the United States has a direct and special interest in the economic strength of the United Kingdom, that interest is subordinate to our vital interest in United States defense efforts, including stockpiling, and the defense efforts of our allies, including the United Kingdom.[89]

While the United States was restricting its production of automobiles, British automobile production was increased at the expense of the domestic economy and the United States stockpile.[90]

CLASSIFIED INFORMATION DISCUSSED WITH FOREIGN NATIONALS

Information concerning the stockpile has always been classified as secret. Notwithstanding this fact, witnesses stated and documents showed that our stockpile activities were freely discussed in the International Materials Conference. In fact, the instructions prepared by the Office of Defense Mobilization, for the guidance of United States representatives on International Materials Conference commodity committees, said:

It is recognized that close security control of any information given these committees is not feasible, both because of the large number of nations involved and the "neutral" position of a few. It is likewise true that any leakage of such information to producers might in some cases have an adverse effect upon the terms of future procurement.

On the other hand, if the United States expects to participate in a critical review of other nations' requirements, it can hardly restrict the figures it furnishes to civilian requirements or an overall lump sum. In fact, if the United States is unwilling to discuss even its immediate procurement plans to some extent, the international conferences would appear to be doomed to at best very partial benefits or, more probably, failure.

On most items, foreign intelligence sources can figure with fair accuracy our military requirements, given a publicized manning schedule and the objectives of procurement plans for some major items. In general, this Nation has rather openly revealed to the world the broad outlines of its immediate rearming plan. Moreover, inadvertent disclosures and relatively complete trade figures have already revealed the general proportions of stockpile procurement. Finally, it is an open question whether a disclosure of immediate procurement objectives would be any more harmful to prices and other procurement negotiations than the current combination of some figures and some rumors.

Accordingly, as a general rule, the following should guide United States representatives. (Where unusual circumstances prevail for an individual commodity or where other major considerations arise, United States representatives should check back with the United States member of the central group for further instructions.)

1. United States representatives should not disclose either the current stockpile status or ultimate stockpile objectives.

[88] Hearings, pt. 4, p. 48.
[89] Hearings, pt. 4, p. 220.
[90] Hearings, pt. 4, p. 219.

2. Information on military requirements and stockpile programs for the immediate period ahead (not more than 1 year in advance) should be provided only if, when and to the extent necessary to further United States objectives in the conferences. Only general justification should be offered, bearing in mind item No. 1 above and the need to avoid any disclosures on rearmament and manning plans that have not been made public.

3. United States representatives thus are generally authorized to submit figures as required on United States civilian requirements, lump-sum figures as required on military requirements for a period not exceeding 1 year ahead, and lump-sum figures on the stockpiling program for a period not exceeding 1 year ahead.[91]

The subcommittee was told that this is a serious breach of security regulations.

The Munitions Board, in its official stockpile report to the Congress dated January 23, 1952, made the following revealing statements:

GSA was directed by DPA to divert to industry scheduled deliveries of a number of materials covered by stockpile contracts or to hold such deliveries in special reserves for future distribution to industry.

Materials affected by such directives include 45,000 short tons of aluminum, 100,000 pounds of columbite, 163,500 short tons of copper, 8,000 short tons of acid grade fluorspar, 6,000 short tons of lead, 9,900 long tons of metallurgical manganese ore, 2,200,000 pounds of nickel, 1,778,000 pounds of tungsten, and 26,900 short tons of zinc. This represents a loss of more than $120 million worth of materials to the stockpile. The shortage of some materials became so acute that quantities already in the stockpile were released for allocation to industry pursuant to Presidential orders recommended by DPA and the Office of Defense Mobilization (ODM). Such releases included 10,000 short tons of aluminum, 55,000 short tons of copper and 30,000 short tons of lead, having a total value in excess of $40 million.[92]

The actions necessary to accomplish the stockpile objectives extend far beyond the basic Munitions Board authority. International and domestic allocations of available supplies, as well as supply expansion programs, are not the immediate responsibility of the Munitions Board but have a direct bearing on the accomplishment of the objectives of the Stockpiling Act. These programs of other agencies are reported here only insofar as they directly affect the stockpiling activity.[93]

Concurrently, the agencies responsible for the administration of the Defense Production Act have accorded to the stockpile a lower priority than that accorded not only to direct military and defense supporting production but also to the continuation of sufficient civilian use of scarce materials to maintain the total national economy at a relatively high level and to minimize avoidable unemployment.

Under these circumstances, the acquisition rates authorized for the stockpile have been set in many instances below prior rates of performance. Support of this policy has in numerous instances resulted in the diversion to industrial use of materials tendered for delivery against existing stockpile contracts and, in the instances of copper, lead, and aluminum, actual withdrawals from the stockpile have been made.[94]

In addition to channeling vital materials in short supply to essential uses within the United States, the Defense Production Administration has taken the lead in endeavoring to secure international allocations of vital materials in short supply in an attempt to meet the total commitments of the free world in the present struggle with Soviet expansionism and aggression. International allocations have sought to provide the necessary materials for the essential defense programs of the free world and at the same time to reduce the inflationary pressures that would result from unrestrained international competition for scarce supplies. A Deputy Administrator of the Defense Production Administration serves as the United States representative on the Central Group of the International Materials Conference and coordinates the activities of the United States members of the several committees covering copper-zinc-lead; cotton and cotton linters; manganese-nickel-cobalt; pulp and paper; sulfur; tungsten-molybdenum; and wool.[95]

Because the stockpile program affects the economic and political relations of the United States with other governments, the Department of State has a number of important functions in support of the program.

[91] Hearings, pt. 4, p. 308.
[92] Hearings, pt. 4, pp. 181 and 182.
[93] Hearings, pt. 4, p. 182.
[94] Hearings, pt. 4, p. 182.

The Department indirectly supports the stockpiling program through its many transactions with foreign governments on commodity problems that arise outside the context of the United States stockpile program itself. The Department represents the United States or participates in such representation in several organizations whose activities affect stockpile progress. Where appropriate, the Department recommends and negotiates intergovernmental arrangements to increase commodity production and to allocate materials.[94]

IMC INTERFERENCE WITH STOCKPILE

Congressman Martin said that although the law clearly provided that the responsibility for determining stockpile policies and objectives rested with the Munitions Board, it had been made a subsidiary agency to the State Department and to the International Materials Conference. If the Korean war had suddenly developed into an all-out conflict, the defenses of this country would have been in a precarious position because of this unauthorized interference with the authority of the Munitions Board.

The subcommittee was also told that the International Materials Conference not only interfered with accumulating a stockpile for a future war, but may have been responsible for the shortage of ammunition at the front in Korea which was reported by General Van Fleet upon his return to this country.

An exhibit presented to the subcommittee,[95] International Materials Conference Memorandum No. 61, is a letter dated May 1, 1951, from J. H. Critchett, of the National Production Authority, to Mr. E. T. Gibson, Acting Administrator of the Defense Production Administration and United States representative on the Central Group of the International Materials Conference. It showed a requirement for tungsten of 200,000 pounds per month for heavy armor piercing shells. The letter said that:

> * * * we need about 60 percent of all free world tungsten, a percentage we probably will not be able to obtain but certainly will not even approach under the present purchasing conditions.[95]

The letter ended with this statement:

> We continue negotiations on the international level with United States policy seeking to allocate equitably the available international supply and in the hope of stabilizing world prices.[96]

It was contended that we were apparently more concerned with equitable allocations and in stabilizing prices that we were in saving the lives of our sons fighting in Korea.

Another document bearing on this problem was a memorandum from Mr. Bramble to Mr. Armstrong, his superior in the State Department. This letter said:

> It also can be argued on the basis of the attached tables that we are receiving a smaller percentage of the free world's supply of tungsten (52 percent) under the IMC than we did in 1950 (73 percent) or in 1949 (55 percent). Most agencies having an interest in the question are convinced that if there were no IMC and if the United States were to bring its full purchasing power to bear it would easily outbid all other countries for the lion's share of the free world's tungsten production * * *.
>
> In view of the many uncertainties involved, it seems likely that a better defense of our membership in the Tungsten-Molybdenum Committee can be made on

[94] Hearings, pt. 4, p. 182.
[95] Hearings, pt. 4, p. 175.
[96] Hearings, pt. 4, p. 176.

political grounds and in general terms than on the basis of a statistical analysis such as that contained in the attched tables.[97]

This document, written early in 1952, is alleged to show that we sacrificed the lives of our sons so as to justify the International Materials Conference on political grounds. The amount of tungsten that we obtained in 1950 without the International Materia's Conference, contrasted with what we obtained under the International Materials Conference when we were shouldering most of the defense responsibilities of the free world, is a shocking indictment of United States participation in this unauthorized international cartel.

While the International Materials Conference was justified as something which was necessary to placate our allies, the subcommittee found that the State Department organized it, ran it, and spearheaded these measures. These following testimony is significant:

Senator MALONE. Did you have anything to do with the organization of the International Materials Conference?

Mr. EVANS. I did have something to do with it in the sense that I have explained, that the office of which I am now the Director was part of the State Department which was concerned with its organization. I think, sir, as we have already testified, that the decisions made by the United States representative in the International Materials Conference were made by another agency.

Senator MALONE. What other agency would that have been?

Mr. EVANS. The Office of Defense Mobilization.

Senator MALONE. This is all very interesting, and I think before we get through, if you are not willing to tell us, we will know the State Department spearheaded the organization of the International Materials Conference.

Mr. EVANS. The State Department did spearhead it before it began operating; yes, sir. In other words, it was the agency in the Government principally concerned with the organizational phase of the International Materials Conference, before it began to operate.

Senator MALONE. Then the State Department did spearhead the organization.

Mr. EVANS. Yes, sir; on direction from the White House.[98]

The subcommittee was told that the countries composing the International Materials Conference allocated materials to nonmember countries. Good international relations are not furthered by such procedures. A review of the organization of the International Materials Conference, prepared by the State Department, included this statement:

The central group, in issuing the initial invitations for commodity committees, attempts to form a committee which will include countries producing most of the free world's supply of the commodity and also the most important consuming countries. At the same time, it attempts to keep the size of each committee down to a level which will enable it to operate efficiently. Since this arrangement necessarily excludes many countries of the free world which have a vital though quantitatively limited interest in the commodity, either as producers or consumers, each committee has adopted rules of procedure under which nonmember countries have an adequate opportunity to make known their requirements and to present their views in writing and, where necessary, in special committee meetings.[99]

Another document prepared by the State Department included this statement:

Nonmember countries participate indirectly in the work of the committees. They are asked to file questionnaires on their supplies and requirements and, if they wish, may appear before the committees to explain their needs. Recommended allocations make provision for nonmember requirements.[1]

[97] Hearings, pt. 4, p. 222.
[98] Hearings, pt. 4, pp. 205 and 206.
[99] Hearings, pt. 4, p. 299.
[1] Hearings, pt. 4, p. 310.

U. S. ASSUMED MOST OF THE EXPENSES OF IMC OPERATION

The attitude of other countries toward the International Materials Conference is further revealed by the fact that the United States, while assuming most of the expenses of the Conference, had great difficulty in securing even modest contributions from other countries. If these other countries believed that the International Materials Conference was of benefit to them, it would not have been necessary for the State Department to have written dunning letters to their embassies.[2]

The continuing influence of the State Department in the operations of the International Materials Conference was further illustrated when the subcommittee was told that the Secretary of State exerted diplomatic pressure to force another country to accept the recommendations of the Tungsten-Molybdenum Committee fo the International Materials Conference in regard to price fixing.[3] Despite these pressures, this country refused to accede to IMC price fixing. This refusal resulted in a termination of maximum and minimum prices for tungsten in subsequent allocations.

The introduction of price fixing clearly showed that the International Materials Conference was an implementation of the commodity agreement concept originally provided in chapter VI of the Habana Charter. A memorandum prepared by a foreign member of the International Materials Conference secretariat clearly recognized that the IMC was a commodity agreement and logically should be considered as such. This memorandum[4] included the following comments:

> Because of their failure to find any solution to these problems, the various international bodies set up after the war to study raw materials achieved no substantial results. Apart from the wheat agreement, which remains the main monument to these efforts, the various study groups, on such commodities as rubber, tin, wool, etc., have produced no results.
>
> At first sight, the viewpoint of the International Materials Conference may appear very different from that of the commodity agreements, but closer study reveals that the differences are not basic and that the success or failure of IMC will depend upon its ability to solve such problems as have so far remained incapable of solution.
>
> With this situation in mind, it seems desirable briefly to review these problems, under two separate heads, according to whether they bear mainly upon the question of price or that of trade patterns.[5]
>
> International allocation appears in a fairly simple light when it applies to a material with an unchanging price on the various markets; such is the case, at least in this respect, of wool, for which the discrepancies existing between prices quoted at Melbourne, Buenos Aires, London, Antwerp, and New York reflect differences in grades, transport costs, or customs duty, but no lasting divergence ever appears between quotations from the various countries. In such a case, it is theoretically sufficient to determine the quota of each consumer country, without having to take into account the source of supply.
>
> In such a case, obviously, the task of the allocating body is complicated by the fact that a quota on a low-price country is not comparable to one on a high price producer.
>
> A difficulty of this kind may be solved in three ways:
>
> (1) The first solution is to bring about an alinement of prices between the different producers, through international action to modify the quotations of certain countries.
>
> Such intervention in the home policies of producer countries should be considered together with similar action under section III.[6]

[2] Hearings, pt. 4, p. 271.
[3] Hearings, pt. 4, pp. 326 and 327.
[4] Hearings, pt. 4, p. 271-273.
[5] Hearings, pt. 4, p. 273.
[6] Hearings, pt. 4, p. 273.

While the State Department raised the issue that there was no connection between the Havana Charter and the International Materials Conference, the above document indicated that the connection was apparent to foreign observers.

SENATE AND HOUSE ACTION ON IMC

In the early months of 1952, unemployment in the United States was said by witnesses to be due to the allocations of the International Materials Conference had assumed serious proportions. Senator Ferguson first brought the activities of the IMC to the attention of the Congress in a series of five speeches delivered on the Senate floor during the months of January and February 1952.

On March 17, he introduced an amendment to the Defense Production Act so that the powers granted the President under that act could not be used to implement International Materials Conference allocations. Hearings on Senator Ferguson's amendment were held by the Senate Committee on Banking and Currency on March 21, 1952. Mr. C. E. Wilson, the Defense Mobilizer, had been scheduled to appear to present the administration justification for the International Materials Conference. He was prevented from doing so by the steel strike and the Defense Production Administrator, Mr. Manly Fleischmann, read Mr. Wilson's statement. Mr. Fleischmann said that: "What I am going to read is Mr. Wilson's own statement. It was not prepared by me. He prepared it personally and it is his own conviction, and he has asked me to say that to the committee."[7]

It so happened that Mr. Edmund Getzin of the State Department had addressed the American Institute of Mining and Metallurgical Engineers in New York just 1 month before. The statement Mr. Fleischmann read as Mr. Wilson's own statement turned out to be virtually Mr. Getzin's speech of a month earlier.[8] This according to an exhibit showed that the State Department was setting the policy for other agencies and writing the testimony of the Office of Defense Mobilization to influence the Congress.

A document from the files of the State Department, document No. 49, was presented to the subcommittee.[9] This document had been prepared for the guidance of a foreign aid steering group within the Department. Parts of the document were classified, and other portions were unclassified. The subcommittee found that, while the unclassified portion of the document gave the impression that all countries were pleased with the activities of the International Materials Conference, the classified portion clearly showed that there was great reluctance on the part of many countries in accepting IMC allocations.[10] The classified part, on page 8, says: Many producing countries are showing considerable reluctance about entering in allocation agreements. There are a number of reasons for that reluctance.

Following Senator Ferguson's statement, the House minority leader, Joseph W. Martin, Jr., appointed four non-congressional committees of Republican Congressmen to review the activities of the International Materials Conference. These committees were headed

[7] Hearings, pt. 4, p. 244.
[8] Hearings, p. 4, p. 241.
[9] Hearings, pt. 4, , p. 294.
[10] Hearings, pt. 4.

by the Honorable Frank T. Bow, Antoni N. Sadlak, George A. Dondero, and Edward H. Jennison.[11] They showed that the International Materials Conference had curtailed our civilian economy, it had interfered with our stockpiling program, and its activities were completely unauthorized. Congressman Sadlak introduced amendments to the Defense Production Administration similar to those introduced in the Senate by Senator Ferguson. The Sadlak amendment was scheduled for floor debate on June 19, 1952.

On June 17 the Defense Production Administration released a report on the copper supply.[12] This report announced that, due to the emergency, the Office of Defense Mobilization would allocate additional copper to domestic users, and that copper would be withdrawn from the stockpile to meet civilian needs. The subcommittee found that the emergency which prompted this action was the prospect that the Congress was about to curtail the activities of the International Materials Conference.

The Congress was so anxious to curtail United States participation in the International Materials Conference that it adopted an amendment to the act appropriating moneys for the State Department during the fiscal year 1953. This amendment prohibited the expenditure of any funds by the State Department in behalf of the International Materials Conference.[13]

In spite of this congressional mandate to discontinue United States participation in the International Materials Conference, the Defense Production Administration, on August 20, announced that it had taken over the responsibility of providing United States personnel for the Secretariat in the International Materials Conference.[14]

This action was defended by the Comptroller General in a letter to Senator Ferguson dated September 23, 1952.[15] It is alleged that the Comptroller's ruling, in this instance, was at variance with his rulings on the Fallbrook case [16] which related to an amendment to the appropriation of funds to the Justice Department contained in this same act. Mr. Winant defended this action in his appearance before the subcommittee.[17]

The subcommittee hearings showed that the International Materials Conference was not finally disbanded until December 31, 1953. The IMC is no longer in existence, but the difficulties which it caused are still with us. Nickel is still in scarce supply as we are attempting to build up our stockpile, which we were prevented from accumulating during the operation of the International Materials Conference. While copper and zinc were under domestic allocations to implement IMC "entitlements for consumption," the Economic Cooperation Administration and Mutual Security Agency furnished European nations with funds to purchase these materials.[17a] In fact, during the period April 3, 1948, through June 30, 1951, this country furnished $360.9 millions to purchase copper, $81.7 millions to purchase zinc, and $58.3 millions to purchase lead. These purchases were made by other governments at prices greatly in excess of the domestic

[11] Hearings, pt. 4, p. 1069, exhibit 33.
[12] Hearings, pt. 4, exhibit 32, p. 1066.
[13] Hearings, pt. 4, p. 40.
[14] Hearings, pt. 4, exhibit 26, p. 41.
[15] Hearings, pt. 4, p. 42.
[16] Hearings, pt. 4, exhibit 27, p. 994.
[17] Hearings, pt. 4, p. 247.
[17a] Hearings, pt. 4, pp. 57 and 58.

ceiling price. When the emergency abated, it was testified this material was dumped on our markets, further aggravating the difficulties of the domestic producers.[18]

The committee also reviewed the work of Mr. Armstrong in connection with the negotiations for a proposed rubber agreement,[19] and the work of Mr. Evans in connection with the tin agreement.[20] Their testimony indicated that the group in the State Department, who have been concerned with commodity agreements from the time of the Havana Charter, were responsible for the formulation of policy within the State Department in regard to the International Materials Conference, and they are apparently the individuals who are most concerned with any further work on commodity agreements, which the Department may now be considering.

[18] Hearings, pt. 4, pp. 62 and 63.
[19] Hearings, pt. 4, p. 151.
[20] Hearings, pt. [illegible], p. 160.

COMMODITY AGREEMENTS UNDER UNITED NATIONS AUSPICES

This section on commodity agreements under United Nation's auspices is from the testimony of officials of the Department of State and experts appointed by the Secretary General of the United Nations contained in hearings, part 5.

The subcommittee in January 1954 learned that a committee of experts appointed by the Secretary General of the United Nations had prepared a study entitled "Commodity Trade and Economic Development." This study was authorized by Resolution 623 of the 7th session of the General Assembly of the United Nations in December 1952. It is important to realize that many of the countries who were furthering this resolution wished to establish a world system of parity prices for raw materials under the auspices of the United Nations and also wished to discourage the production of synthetic rubber and synthetic fibers in the United States which might displace natural products.

In April 1954 the Economic and Social Council of the United Nations reviewed this report and had before it a resolution to establish a Permanent Advisory Commission on International Trade which, in effect, would have reestablished the International Trade Organization without congressional sanction. The United States delegate to the Economic and Social Council, Mr. Preston Hotchkis, voted against the establishment of this proposed new United Nations Commission.

Despite United States objections, the Council voted to proceed with the commission: There were 12 votes in favor; 5 votes against; and 1 abstention. Following the meeting of the Economic and Social Council of the United Nations the subcommittee conducted a hearing on May 26, 1954, at which the Assistant Secretary of State Samuel C. Waugh testified concerning the United States position taken in the Economic and Social Council and responded to questions concerning our future position at the forthcoming meeting of the Council which starts in Geneva early in July.

The subcommittee noted that Secretary Waugh supported the position of the United States delegate, Mr. Hotchkis, and furthermore that he categorically stated that this Government was opposed to such agreements and that he did not feel that the United States would be morally bound by any actions taken to establish such an advisory commission.

The following quotation is taken from the transcript:

Senator MALONE. I am sure that even now members of the State Department are not fully aware of the long range plans that have been made to control the domestic economy of the United States through the United Nations and other sources, and to do this job, whether or not the Congress of the United States approves.

Will you give us the benefit of your comment on the position of the State Department as to its future action and participation in this Permanent Advisory Commission on International Commodity Trade, in view of the fact that the governments of the member states, the Economic and Social Council, are to transmit their views concerning their participation in the Commission before the 18th session of the Council which opens in Geneva in July?

Mr. WAUGH. My thinking, Mr. Senator, is that the position taken at * * * will be the same as taken by Mr. Hotchkis and as read into the record by you.

Senator MALONE. In other words, you will oppose it?

Mr. WAUGH: It is my understanding that that will be the position, of course. There has been no change in that.

The subcommittee at its hearing on May 26 also received testimony from Dr. Klaus Knorr, presently associate professor of public and international affairs, Woodrow Wilson School of Public Affairs, Princeton University. Dr. Knorr was the only American among the five experts who prepared the report authorized by the General Assembly.

He has become an authority on commodity agreements, having been associated with the Food Research Institute at Stanford University which is regarded as the outstanding research center in this field. Dr. Knorr told the subcommittee that he felt that he had performed an important service in becoming associated with this committee of experts in that he had been able to temper the contents of the report and prevent the inclusion of some of the more extreme proposals which had originally been advanced by the countries who favored the resolution adopted by the General Assembly in 1952. Dr. Knorr advised the subcommittee that he felt that commodity agreements would not advance the economic development of underdeveloped countries. The following is taken from the testimony:

Senator MALONE. You mean that your conclusions did not coincide with what they had in mind?

Mr. KNORR. Did not coincide with the majority in the General Assembly, that wanted this report written. I think that is true. You have already read this once briefly, but I read just the main passage here.

"The General Assembly * * * recommends to member states that—

"(a) Whenever governments adopt measures affecting the prices of primary commodities entering international trade, they should duly consider the effect of such measures on the terms of trade of countries in the process of development, in order to insure that the prices of primary commodities are kept in an adequate, just and equitable relation to the prices of capital goods, and other manufactured articles, so as to permit the more satisfactory formation of domestic savings in the countries in the process of development, and to facilitate the establishment of fair wage levels for the working populations of these countries. * * *"

now the key words are "adequate, just and equitable relation," which occurs in several other passages of the Assembly resolution.

In other words, it was quite clear to me that what they wanted the committee of experts to do is to tell them how to set up an international parity scheme of the kind that we have in the United States for domestic farm products.

I think this was quite clearly the intention of the Assembly, and, in fact, one of the reasons, and I think probably the main reason that moved me to agree to be a member of this committee was that I thought it would be a good idea to talk them out of it, if I could, because I do not believe in such a system. I do not believe in it particularly for the United States, and certainly not as an international scheme.

Senator MALONE. You do not believe in it for what particular reason, if we could enlarge on it? Because it was impossible or because it is just impractical?

Mr. KNORR. Well, in this international field——

Senator MALONE. In the international field?

Mr. KNORR. I think it is totally impractical. I think quite clearly most nations would not have anything to do with it and most nations would be right in coming to that sort of conclusion, because what you would be doing then would be transferring income from the wealthier countries to the poorer countries. Maybe for certain purposes this should be done, but let us then do it openly and aboveboard. Let us not do it by monkeying around with markets.

Dr. Knorr further testified that the proposal adopted was not what he had in mind when the report was prepared and he thoroughly approved of the decision of the United States Government in refusing to vote affirmatively for the resolution presented at the meeting of the Council. The following is taken from the transcript:

Now let us get to this thing that you helped build. Now should we have an agreement, and what should be the provisions of this international agreement with which we did not agree? Now we had the State Department officials here, and I think they are entirely right, and I complimented the Assistant Secretary this morning on the vote that his man cast. But do you think we should have voted against it?

Mr. KNORR. I think it was entirely right for the United States to vote against it. I would have advised the United States Government to vote against it if I had been asked.

Senator MALONE. You think it would injure us to enter into such an agreement?

Mr. KNORR. I don't think it would injure the United States. I cannot really quite see that it would injure the United States very much, but, it not being in the United States interest to do it anyway, I would advise the United States Government not to do it.

Senator MALONE. You do not think it is in our interest?

Mr. KNORR. No. And what is not in the United States interests should not be done by the United States Government.

Senator MALONE. God bless you for that statement.

The State Department's refusal to sign the International Tin Agreement negotiated at the close of 1953 and its action in the Economic and Social Council of the United Nations shows a reversal of a trend which has persisted ever since the close of World War II to attempt to solve the world's economic ills through a series of such agreements according to the testimony. In the hearings conducted by the subcommittee statements indicated that changes have taken place in the last few months. The subcommittee noted the changed position which the State Department has taken.

Congress, in the past has consistently refused to endorse the Havana Charter and the International Trade Organization. Despite the will of Congress, we have seen numerous attempts in one guise or another to embroil the United States in an international trade organization under one name or another. Witnesses warned that constant vigilance must be exercised over groups that persistently endeavor to involve this Nation in such agreements.

THE PALEY REPORT

The President's Materials Policy Commission was appointed in 1951 and William S. Paley was named its Chairman. This Commission submitted its report in June of 1952. The Commission's report was later submitted by the President to the National Security Resources Board, who was asked to secure an evaluation of the report by each of the Government agencies and to then make suitable recommendations for legislation.

Mr. Jack Gorrie, Chairman of the National Security Resources Board, submitted a comprehensive study to President Truman with legislative recommendations in December of 1952.

The report of this Commission, popularly known as the Paley report, has had very far-reaching effects. It has been widely quoted by economists, conservationists, and social scientists. It has been referred to in international meetings and in the discussions at the United Nations as an authoritative text.

In fact, it has even been used as the theme for the textbook dealing with natural resources now used at the United States Military Academy at West Point. It has had a profound influence on the policies of many Government agencies dealing with the production of critical materials.

The Commission's report is a five-volume study. The principal recommendations, beliefs, and conclusions are found in volume I. Volume II presents a detailed study of the supply and demand relationships for nonfuel minerals and other resources projected into the decade of 1970 to 1980.

Volume III is similar to volume II but deals primarily with mineral fuels and water power. Volume IV contains a series of signed technical articles dealing with the technological aspects of the resources problem. Volume V contains a number of signed monographs by consultants and members of the staff.

In view of the use of this document as an authoritative source of information on all resource problems by so many organizations, the subcommittee made a staff study of the entire report which is included as an exhibit in part 8 of the committee hearing.

Two members of the Commission, William S. Paley, its Chairman, and Edward S. Mason, appeared before the subcommittee on April 9. Their testimony was directed primarily to the objectives and the basis for their recommendations. The economic aspects of the study and also a review of the methods which were used in making the long-range projections of the supply and demand for strategic and critical materials upon which the findings in volume I depend were covered by their testimony.

Both Mr. Paley and Mr. Mason testified that they had no knowledge or previous experience in the minerals and materials industry. In fact, Mr. Paley testified:

> I have had no experience in the field of raw materials as such. That fact was pointed out as clearly as possible by me to those who wanted me to undertake the

job. I resisted taking the job for a long time and only finally took it when it became almost embarrassing for anybody after the outbreak of the Korean war to refuse to do any job which was requested of one by his Government.

Two members of the Commission, Messrs. George R. Brown and Arthur H. Bunker had previous experience which would give them some competence to make this study. The staff study prepared by the subcommittee reviews the experience and background as revealed in public sources of the members of the Commission and the staff who are listed in volume I.

The subcommittee endeavored to secure as much information as possible regarding the techniques used in making these long-range projections. This was done because so many prominent groups and individuals have used the data in the Paley report to indicate that this country would exhaust its minerals supply by 1975. The two Commissioners who appeared before the subcommittee stressed that the projections in their report should not be taken as a prediction. Mr. Paley said:

I would like to emphasize that we made no prophecies about the amount of materials that the United States might be consuming by 1975. Nobody can prophesy a thing like that. We did try to make some informed estimates about possible demand.

The following statement by Dr. Mason is particularly significant:

There is one more statement I would like to make and that is I would like to call your attention to the difference between a projection and a prediction here. I think you will find if you look at this report that the Commission nowhere predicts. What it does do is to project requirements on the basis of certain assumptions. If those assumptions are correct then the projection might turn out to be a good prediction but the projection is only as good as the assumption on which it is based and nowhere does the Commission so far as I remember make any predictions as to what our requirements are going to be. It says only that if these assumptions are reasonable assumptions then it is probable that our requirements will be such and such 25 years from now.

This statement is noteworthy as the general public may have interpreted the report of the President's Materials Policy Commission as a scientific study predicting supply and demand relationships for numerous commodities during the decade 1970 to 1980.

The subcommittee was told that the projections published indicated a degree of accuracy not at all warranted by the underlying assumptions. These inconsistencies are developed with considerable documentation in the staff study. During the hearings, Commissioners Paley and Mason asserted that these statements should be regarded as good guesses and not as predictions. The subcommittee believes that it has performed a useful service in placing these projections in their proper perspective. For example, Mr. Paley said:

The basis of our calculation of demand was a population of 193 million—by the way, the Bureau of the Census since our report was issued stated they believe the range now will be between 199 million to 221 million.

Since population projections are the basis for all of the long-range projections on the demand for specific materials, this statement by Mr. Paley shows the extent the projections have already deviated from the premises of the original report as presented in 1952.

PALEY STATES UNITED STATES WILL NOT RUN OUT OF MATERIALS

Commissioner Paley, in his testimony, stated:

> There is, as the Commission saw it, no chance of the United States actually running out of materials. We are not and will not be in the foreseeable future a have-not nation.

It was testified that many people have attempted to use the report of the Paley Commission to show that the United States was in imminent danger of becoming a have-not nation. The Commission in its report stresses its belief that we should seek to obtain materials on the basis of "a low real cost principle." The subcommittee was particularly interested in developing Commissioner Paley's views on this point. Commissioner Paley testified that security needs should be met by stockpiling or by direct Government contracts to maintain sufficient standby capacity. However, he believed that the normal needs of industry should be met by purchasing the materials this country needs wherever it can find them at the lowest cost, if security needs can be met by stockpiling or in some other manner. The following colloquy between Mr. Paley and the chairman is of particular interest:

> Senator MALONE. Government contractors in the United States are compelled to comply with the Walsh-Healey Act which provides for the establishment of minimum wages on Government contracts. Minimum wages established under the Walsh-Healey Act may be far higher than those specified in the Fair Labor Standards Act. In fact, within wide limits they might be set at any point which the Secretary of Labor finds proper. If this act is continued and the Buy American Act is repealed, American contractors are at a serious disadvantage in competing with foreign bidders. Do you still take the same attitude that the low bid must be accepted unless it really endangers security?
>
> Mr. PALEY. Yes, sir.

Commissioner Paley still supports the Commission's recommendations that our tariffs should be lowered and that the Buy American Act should be repealed. The evidence presented by many witnesses in the hearings before this subcommittee does not support Commissioner Paley's views.

The subcommittee endeavored to determine whether all of the recommendations contained in the report were the unanimous judgment of the five Commissioners. Mr. Paley said:

> In every case the recommendation was unanimous. There is no minority comment about any of the recommendations which we made, and we made some 78 in number.

The subcommittee staff study contains a transcript of a panel discussion before the American Mining Congress held at Denver in September 1952, in which Commissioners Brown and Bunker participated. Mr. Brown, at that time, explained how the differences between members of the Commission were reconciled. He said:

> I would like to say a word, I think every person who reads this report will find "believe" and "recommend" but you can readily see where you have five on a Commission that you have a lot of differences of opinion and we wrote a lot of pages you are reading and where we could not come to complete agreement, we failed to recommend. We simply said "We believe," and if you will read the report with that in mind I think you will see that this controversial thing we have been talking about most today is a recommendation by this Commission and we did not in any way intend for it to be a recommendation.

It is quite apparent that there were differences among members of the Commission and minority views were not shown by footnotes.

The subcommittee invited Commissioner Mason to testify since it appeared that he had the major responsibility for those portions of the report which involved the most controversy. They were the proposals contained in chapter 15 of volume I for international commodity stabilization and buffer stock arrangements. The subcommittee found Commissioner Mason had written a book entitled "Controlling World Trade" which had been published by the Committee for Economic Development in 1946. This book dealt with the commodity stabilization proposals which were later incorporated into chapter VI of the Havana Charter.

The Paley Commission endorsed chapter VI and made a statement with which the subcommittee cannot concur. On page 87 of volume I of the Paley report, in discussing the Havana Charter, it said: [1]

> The United States has not ratified the treaty, but under a resolution of the United Nations Economic and Social Council is bound with other nations to recognize chapter VI as a general guide.

It was because of these statements that the subcommittee was interested in learning more about Dr. Mason's views.

The testimony developed in part IV, International Materials Conference, showed that chapter VI of the Havana Charter originated from a document known as Proposals for Expansion of World Trade and Employment released by the United States State Department in November 1945. All of the proposals were subsequently incorporated into the Havana Charter and most of them have been taken over by the United Nations Economic and Social Council in one form or another.

The chairman asked Commissioner Mason whether he had played any part in the development of these proposals. The following colloquy is of interest:

> Senator MALONE. What part did you play in the arranging of these economic affairs in 1945? You were Deputy Assistant to the Secretary of State, then?
>
> Mr. MASON. Yes; Will Clayton was the Assistant Secretary. I was the chairman for the previous couple of years for an interdepartmental committee working on cartel problems. Of course, as Will Clayton's deputy, I had some general oversight of the economic work of the State Department.
>
> Senator MALONE. Did you play any part in preparing the proposals that led to the International Trade Organization?
>
> Mr. MASON. No; because I was out of the Department by that time. I left the Department in June 1945, and all these ITO negotiations took place between then and I believe roughly 1947 and 1948.

While it is true that the actual International Trade Organization negotiations took place after Dr. Mason left the Department, testimony indicated the proposals themselves were being developed during the early months of 1945 when Dr. Mason played a very influential role in the formulation of the State Department's economic policy.

The President's Materials Policy Commission's Report, in volume I, chapter 15, endorsed the type of intergovernmental commodity agreement envisaged in chapter VI. This chapter has been responsible for much of the adverse criticism directed at the report.

Both Chairman Paley and Commissioner Mason agreed that they now had grave doubts as to whether a buffer stock and intergovernmental commodity agreement would work. Mr. Paley said:

> Mr. PALEY. Senator, I am not recommending the recommendation of the buffer type of control as I have repeated 2 or 3 times today. I said I had very

[1] Report of the President's Materials Policy Commission, vol. I, p. 87.

serious misgivings about it. I think it would be a mistake if it were introduced. I think it would be at times at least in contradiction to the free price competitive method which we have relied on so successfully during the many years of our industrial growth.

Mr. Mason said:

If stabilization measures are to be attempted for internationally traded materials—and I admit that at this juncture I am doubtful about the wisdom of any such attempt—they should be undertaken in ways that interfere least with the principle of meeting materials requirements from lowest cost sources.

* * * I am not at all sure in my own mind that this is a practicable sort of arrangement. So I am doubtful really as to whether this problem of instability can be handled effectively through any device that I have yet seen put forth.

In spite of the fact that members of the President's Materials Policy Commission now reveal some doubts about the wisdom of the recommendations contained in chapter 15, witnesses stated their original words have been picked up by others and are used to embarrass the United States in international negotiations.

The study, Commodity Trade and Economic Development, prepared by a committee of experts under Resolution 623 of the Seventh Session of the General Assembly of the United Nations, proposes a new trade stabilization commission. This Commission could conceivably operate buffer stocks and engage in all of the other activities provided in chapter VI of the Havana charter.

Page 34 of the United Nations study uses chapter 15 of the Paley study which has now been repudiated in these hearings as the authority for the adoption of a new organization by the United Nations.

Examination of this monumental effort shows that many of the recommendations of the Commission are sound and have merit. Testimony indicated the excellence of the studies in volume IV, which represent a significant contribution to technology and our basic scientific knowledge.

The subcommittee, however, was unable to accept the thesis that the best way to promote the welfare of the United States would be to increase our reliance on foreign sources for materials necessary to maintain our economy in times of peace or war.

The projections in volume II which have in turn furnished the statistical data upon which many of the conclusions and recommendations in volume I are based were questioned in Mr. Paley's appearance.

The recommendations are derived from the studies in volume II of the Paley report. They were not substantiated in Mr. Paley's testimony.

The staff study alleges that while the Commission consistently extolls private enterprise, its recommendations would require more Government intervention and fundamental changes in the American free enterprise system. The Commission itself shows the fallacy of hoarding materials. It said:[1]

In developing America our forebears consumed resources extravagantly, but we are certainly better off in materials supply than they were. It would be unreasonable for us, their posterity, to suggest that they should have consumed less so that we might consume more. If then through developing the opportunities inherent in the flexibility of our resource base, we can provide our posterity with a better return of goods and services for their labor than we get for ours, we need not feel compelled to restrain specific consumptions of materials to make theirs even larger—any more than our New England forebears needed to conserve bayberries for candles to light a generation that lives by kilowatts. We can, if our basic materials policy is sound, provide for posterity the prospect of increasing

[1] Report of the President's Materials Policy Commission, vol. I, p. 21.

consumption without stinting ourselves by restricting the rates of efficient withdrawals of our resources.

After making this statement the Commissioner then discusses the waste of lead used in producing high antiknock fuels.[3]

American industry will continue its traditions of resourcefulness and ingenuity. The use of lead in high antiknock fuels will not deprive our descendants of lead any more than we have been deprived of bayberries. It has been testified to that there are at this time in any case more reserves of lead than a quarter of a century ago.

It is not only conceivable, but highly probable, that in the future new prospecting techniques will produce a great deal more lead than we now believe is available and, in addition, there will be synthetics and other materials which will replace present minerals and materials just the way electric power replaced bayberries.

American industry operating without artificial restraints and Government control is our greatest asset and represents a resource in itself of the first magnitude.

One of the principal criticisms made of the Paley Commission report is that its staff was not composed of men experienced or well grounded in the field of production of minerals and other materials. It is alleged it was woefully lacking in skilled engineers, geologists, and men with industrial background. Its report is a compendium worked out by economists and theorists based upon statistical assumptions of questionable validity.

The staff, according to reports, appeared to be biased with predetermined objectives. The high quality of parts of the President's Materials Policy Commission's study is possibly marred by the interjection of questionable statistics and a set of ideas held prior to the study.

The subcommittee has presented its own staff study analyzing the report in some detail so that future readers of the President's Materials Policy Commission's report will have the benefit of this subcommittee's work.

[3] Report of the President's Materials Policy Commission, hearings, pt. I, p. II.

FOREIGN TRADE

The following section of the Summary of Evidence is an analysis of the problems of free trade setting forth a particular viewpoint on the manner in which it affects strategic materials.

This analysis is not intended as a conclusion of the subcommittee, but merely as a basis for information.

Most people believe free trade is achieved when tariff barriers are eliminated, and are deluded with the belief that if a country had no tariffs or import quotas it is operating on a free-trade basis. This definition is incorrect as a full free-trade economy requires many other conditions if it is to function successfully.

When we propose free trade on an international basis, we must be ready to urge the international adoption of the following conditions rather than merely the elimination of United States tariffs. Until all nations are ready and willing to accept such conditions the United States tariff is the only protection afforded the working man and businessman in this country.

No one can advocate free importation of the products of "sweatshop" labor and not accept free immigration of the labor itself—the effect is the same.

PRINCIPAL FEATURES OF AMERICAN ECONOMY

The internal economy of the United States has free trade. The principal features of the American economy may be described as follows:

A. No tariffs or other limitations on the free flow of goods, investments and services between the 48 States.

B. Free movement of peoples between the States. Any citizen of the 48 States can change his residence at will and after a brief period becomes a citizen in good standing with the right to vote in any State in which he may elect to establish his residence. (If this were to be applied on an international scale, it would require the elimination of our immigration quotas.)

C. A uniform currency which has the same value in all of the States and may be transferred from New York to San Francisco, or any intermediate point, by merely drawing a check on one's own bank. (Free trade internationally would require full convertibility of currencies and the elimination of multiple exchange rates, blocked currency, etc.)

D. A private enterprise economy. Each of the 48 States adheres to the principles established in the Constitution which foster private enterprise. Trade between the States is trade between individual citizens and private corporations.

The citizen of any State is free to make an investment in real property or a productive plant in any other State and may control a business through ownership of its assets in a State in which he does not reside. (Internationally this would require

the elimination of government production and sale of articles in world trade by socialistic governments' cartels, commodity agreements, etc., and an insistence that all trade be conducted by private organizations.

Furthermore, it would require a complete abandonment of the policy of expropriation of private property by foreign governments and complete equality of treatment by all governments between foreigners and their own nationals engaged in productive enterprise.)

E. Uniform laws and customs. Each of the 48 States has laws and customs that stem from a common origin and make free trade throughout the United States feasible. (Internationally there is no such common denominator of ideas and ideals by which trade can be transacted.)

ADAM SMITH—THE WEALTH OF NATIONS

Adam Smith in his classic work, The Wealth of Nations, published in 1776, was the father of free trade. His arguments have been reiterated by others, but no one has improved upon Adam Smith in the clarity and forcefulness of his presentation. Book IV, chapter 2, of The Wealth of Nations ably develops this philosophy of free trade.

LIMITATIONS ON FREE TRADE

Adam Smith recognized two limitations on the free trade theory which are applicable today. First he said that "it will generally be advantageous to lay some burden (tariffs) upon foreign imports for the encouragement of domestic industry, when some tax is imposed at home upon the produce of the latter. In this case, it seems reasonable that an equal tax should be imposed upon the like produce of the former."

This obviously means that no tariff can ever be bound at a rate below that set by the manufacturer's tax on the domestic product including all the taxes levied on domestic firms including social security and unemployment insurance taxes. With excise taxes on transportation and communication services which enter into the production cost of all goods produced at home, this philosophy places a definite limitation upon agreements to bind present tariff rates.

Certainly if the Congress were to impose a uniform manufacturer's excise tax in place of the numerous discriminatory excises which now exist, we would be embarrassed in equalizing taxes on imported products if we are bound under general agreements on trade and tariffs not to increase tariffs on those products which now have no manufacturer's excise taxes.

It might also be questioned whether we might not give some consideration in adjusting tariffs to the great increase in our corporate income taxes, as well as the imposition of social security taxes, since 1934 when we started to reduce tariffs under the 1934 Trade Agreements Act.

These increases in Federal taxes have increased the costs of the domestic producer. Inasmuch as a large portion of the taxes collected on United States corporations was used to finance the capital cost of foreign producers by direct Government gift, these United

States taxes as a cost item should be given special consideration in the setting of future tariff policy.

While Adam Smith showed that free trade would maximize the opulence of every country, it is significant that he recognized that opulence must give way in a world beset by animosities. One of the impediments to free trade in the England of Adam Smith's time was the act of navigation. This act placed a heavy burden (tariffs and other restrictions) on foreign trade. Adam Smith, however, stated:

> The act of navigation is not favourable to foreign commerce, or to the growth of that opulence which can arise from it. * * * As defence, however, is of much more importance than * * * opulence, the act of navigation is, perhaps, the wisest of all the commercial regulations of England.

Excerpts from his full development of these points follow:

> The first is, when some particular sort of industry is necessary for the defence of the country. The defence of Great Britain, for example, depends very much upon the number of its sailors and shipping. The act of navigation, therefore, very properly endeavours to give the sailors and shipping of Great Britain the monopoly of the trade of their own country, in some cases, by absolute prohibitions, and in others by heavy burdens upon the shipping of foreign countries.
>
> When the act of navigation was made, though England and Holland were not actually at war, the most violent animosity subsisted between the two nations. It had begun during the government of the long parliament, which first framed this act, and it broke out soon after in the Dutch wars during that of the Protector and of Charles the Second. It is not impossible, therefore, that some of the regulations of this famous act may have proceeded from national animosity. They are as wise, however, as if they had all been dictated by the most deliberate wisdom. National animosity at that particular time aimed at the very same object which the most deliberate wisdom would have recommended, the diminution of the naval power of Holland, the only naval power which could endanger the security of England.
>
> The act of navigation is not favourable to foreign commerce, or to the growth of that opulence which can arise from it. The interest of a nation in its commercial relations to foreign nations is, like that of a merchant with regard to the different people with whom he deals, to buy as cheap and to sell as dear as possible. But it will be most likely to buy cheap, when by the most perfect freedom of trade it encourages all nations to bring to it the goods which it has occasion to purchase; and for the same reason, it will be most likely to sell dear, when its markets are thus filled with the greatest number of buyers. The act of navigation, it is true, lays no burden upon foreign ships that come to export the produce of British industry. Even the ancient aliens duty, which used to be paid upon all goods exported as well as imported, has, by several subsequent acts, been taken off from the greater part of the articles of exportation. But if foreigners, either by prohibitions or high duties, are hindered from coming to sell, they cannot always afford to come to buy; because coming without a cargo, they must lose the freight from their own country to Great Britain. By diminishing the number of sellers, therefore, we necessarily diminish that of buyers, and are thus likely not only to buy foreign goods dearer, but so sell our own cheaper, than if there was a more perfect freedom of trade. As defence, however, is of much more importance than opulence, the act of navigation is, perhaps, the wisest of all the commercial regulations of England.

FREE TRADE ADVOCATES ASSUME A WORLD AT PEACE

All of the many modern textbooks on foreign trade develop the theory of free trade in terms of welfare economics in a world at peace. Certainly the animosities between the Iron-Curtain countries and the free world countries make it necessary for us to consider strategic considerations if we are to follow the advice of Adam Smith, the father of the free-trade philosophy.

Strategic considerations today make it imperative that we maintain going-concern industries in the production of basic materials and manufactured goods essential to our security in the event of war.

This automatically requires that those domestic industries which would be displaced by foreign industries enjoying a greater comparative advantage must be protected until the peace of the world is assured and strategic considerations can give way to welfare economics.

Should world war III engulf this country, in addition to having a stockpile of strategic and critical materials, we should have a going-concern industry which could be expanded so as to meet the needs of any emergency.

If we are dependent upon foreign producers whose governments may be unfriendly, unstable, or may even be displaced by Communist governments, as had happened already in Czechoslovakia, we are gambling with our own security.

Even if foreign producers are able to produce materials, we still have the problem of getting them to our own shores. This requires convoy operations which are costly and will be even more difficult in world war III with the new modern submarines and atom bombs available to our enemies to destroy ports and industrial operations far from our shores.

While the Navy may well be able to defend long sea lanes, no one could argue that the same commitment of manpower, surface ships, and aircraft could not be used more effectively in fighting the enemy if such convoy operations were not necessary.

In all strategic considerations we are justified in increasing our dependence on Canadian and Mexican producers and to a less extent on the other countries of the Western Hemisphere, as such sources will be more easily defended rather than those located in Africa and the Far East across major oceans.

FREE TRADE IS NOT A ONE-WAY STREET

Implicit in the adoption of the free-trade philosophy, is the specialization of each country and region in those products in which its comparative advantage is greatest.

If the United States is to remove protection from those industries within its borders having a low comparative advantage, such action must simultaneously be accompanied by the removal of tariff barriers, quota systems and manipulation of currency systems for trade advantage in all other countries.

This obviously requires that Europe become a single economic unit as the barriers to trade between the countries of Europe are far more restrictive than those of the United States with the rest of the world. Furthermore, tariffs are only one form of restriction. Subsidies and other Government assistance to industries having a low comparative advantage are equally obnoxious.

The so-called underdeveloped countries present a special problem inasmuch as they are attempting to industrialize and are restricting the freedom of their own citizens to purchase the goods they would normally buy with the dollar exchange they earn through the sale of raw materials in the United States.

Most discussions of America's foreign economic policy are in terms of changes in United States tariff laws. It should be pointed out that the United States, under the Constitution, can lay no taxes or other imposts on exports. The only restrictions on exports today are those

exercised under the Export Control Act to prevent the flow of strategic materials to Iron Curtain countries.

ACTUALLY THE UNITED STATES IMPOSES LESS RESTRICTION ON IMPORTS THAN MOST OTHER COUNTRIES

Import quotas.—The United States does not use import quotas except for a few agricultural commodities where the maintenance of domestic price supports makes such action mandatory.

More than half of the world's trade is subject to import quotas. Businessmen can adjust to fixed tariffs, but they never know how licenses will be issued to implement a quota. Under the General Agreement on Tariffs and Trade, the 33 signatories are not supposed to maintain such restrictions. However, in 1952 of the $56 billion imported into the General Agreement on Tariffs and Trade countries, $38 billion was under import quota restrictions. At the present time, unrestricted dollar imports are not permitted by any signatory country to the General Agreement on Tariffs and Trade outside the dollar area. Almost all of the countries who are members of the Organization for European Economic Cooperation employ import quotas and other restrictions. The Organization for European Economic Cooperation has set a goal whereby 75 percent of the imports are to be free of quotas. In December 1953 Great Britain's percentage of quota-free imports was only 58 percent.

Currency restrictions.—The United States has no currency restrictions. It applies the most-favored-nation clause in all its trade agreements. It makes no distinction between luxuries and essential goods in its import policy.

This should be contrasted with the British Empire preferential rates and the colonial preferences prevalent in the French colonial trading area.

Blocked currencies are characteristic of most of the countries of Europe and in many cases in South America as well. Special preference for essential goods as determined by Government officials over luxury imports is prevalent in most of the so-called free-world countries today.

EMPIRE PREFERENCES

Problems presented before the last meeting of the countries signatory to the General Agreement on Tariffs and Trade illustrate the obstacles in achieving free trade. Britain was granted a waiver to increase duties to assist fruit and vegetable growers hurt by removal of quotas under the Organization for European Economic Cooperation plan to liberalize intra-European trade.

Great Britain was also granted a restricted waiver on the General Agreement on Tariffs and Trade rule forbidding increases in Imperial preferences. Apparently Britain plans shortly to liberalize her trade with Western Europe and move away from import quotas. This action is to be coupled with tariff increases where necessary to protect local British industries, as well as the British balance of payments.

Britain does not wish to increase the tariffs on commonwealth imports when the rates are raised on West European goods. Australia, at the start of the session, appealed for modification of the General Agreement on Tariffs and Trade clause which prevents an increase in Empire preferences. She even threatened to withdraw from the Gen-

eral Agreement on Tariffs and Trade unless Empire preferences were broadened. Japan was finally admitted to a limited participation in the General Agreement on Tariffs and Trade; however, Britain and most of the commonwealth countries voted against Japanese participation and will not give her goods the right to most-favored-nation treatment.

SCHUMAN PLAN

The Schuman p'an, representing an apparently desirable move toward European unification, has raised a host of new problems including the use of international price, investment, and other controls over vital industries.

Under the present rules, prices of stee' sold to countries outside the jurisdiction of the authority are not under authority control.

Steel-using industries in countries outside the Schuman plan are reported buying steel at prices below those paid by their competitors in Schuman plan countries, particularly Germany.

On the other hand, the United Kingdom has employed double pricing for coal. Continental steel consumers, who are buying steel from the Schuman Plan Coal-Steel Authority, claim this gives British manufactures an unfair advantage because they thus buy steel and coal at artificially low prices.

Mr. Monnet, president of the high authority, in an effort to bring Britain into the European Coal and Steel Community, has intimated that some of the capital which will be raised for the development of the Coal and Steel Community may be offered Britain on terms which would require the British to drop double pricing.

The British would probably not agree as this would raise domestic prices of coal and steel, and thus jeopardize the British export drive.

TRADE WITH COMMUNISTS

Another instance of the problem which besets full free trade is given by Ceylon. Ceylon had a 5-year trade agreement with Communist China, which is reviewable yearly. Ceylon traded rubber for rice. Red China now says she will not continue to pay 1952 prices for rubber.

Ceylon last year gained $20 million by selling rubber at premiums, while buying rice below world levels.

UNITED STATES IS MAKING ALL THE SACRIFICES

Obviously the United States, as one country in the so-called free world, cannot by unilateral action overcome all of the impediments to free trade which exist in the world today.

Certainly if comparative advantage is to be accepted as the criteria and the United States is to sacrifice those industries in which its comparative advantage is low, it must expect that the underdeveloped countries will not subsidize industrialization and will continue in the role of raw material suppliers where their comparative advantage is high.

Much of the difficulty in maintaining multilateral trading today can be traced to the fact that triangular trade between the Latin American and Indonesian areas with the continent of Europe has been broken by the actions of the governments of these underdeveloped areas.

TRADE RELATIONS BETWEEN THE UNITED STATES AND BRAZIL

Imports from Brazil to the United States are under no restrictions, and their volume has been high, providing the Brazilian economy with an ample flow of dollars. Formerly these dollars were spent in Europe which enabled Europe to settle its adverse dollar balance with the United States. Today Brazil, in spite of our purchases, has had great difficulty in settling its own commercial dollar transactions with the United States and it has been unable to furnish the market it formerly provided to Great Britain and the Continent of Europe.

It employs import controls and many restrictive devices at the present time. Foreign investment is discouraged as Brazil has reaffirmed its position that no foreign capital would be welcome in developing her potential petroleum resources.

Brazil's insistence on virtually nationalizing the development of her natural resources has resulted in the ridiculous situation where the rationing of oil supplies is receiving serious consideration, as railroads are being converted to diesel power and automobile imports are increas'ng.

More recently, Finance Minister Aranha has issued new regulations to subsidize agricultural exports and to allocate all foreign exchange for imports.

Receipts from exports are channeled directly to the Bank of Brazil. Exporters of coffee and other agricultural products are to receive bonus payments in dollars or other currencies. The bank retains enough of the balance, about one-third, to cover Brazil's foreign debt service.

The remaining foreign exchange is auctioned to the importers who bid for exchange under five categories ranging from most essential (i. e., aviation gasoline) to least essential (perfume). The auction system for exchange certificates has aroused bitter complaints among Brazilian importers. Aranha has insisted that this procedure must be followed and exports must be stimulated so that Brazil can secure the funds for industrial expansion.

This diversion of dollars to industrial projects has also given rise to inflationary pressures at home, and to discontented workers who are unable to purchase consumer goods. Such policies by underdeveloped countries are not conducive to the development of world trade, and there is little that the United States can hope to accomplish by a unilateral reduction of its own tariffs in curing these conditions, except to jeopardize its security position through becoming dependent upon foreign countries for critical materials without which we could not conduct a war.

UNDER FREE TRADE SOME OF OUR INDUSTRIES MUST DIE

While there can be no question that the free trade theory as developed by Adam Smith has great appeal and offers a utopian promise for a future peaceful world, however, it serves no useful purpose to avoid facing the questions which must be raised in advancing this theory as a legislative program for immediate adoption.

In the first place, we must accept the fact that the policy of permitting comparative advantage to determine which industries shall survive can only be adopted when the world peace is guaranteed and the strategic considerations, already mentioned, can be disregarded.

Under such a policy, some of our industries will cease to exist entirely. This is no mere conjecture, as shown by the history of the newsprint industry. All tariffs on United States newsprint were removed by the Underwood bill, which passed the Congress in 1913.

At the time this bill was passed, there were 70 newsprint mills in operation in the United States. Thirty-two of these mills passed out of existence and the mill towns became ghost towns. Thirty-four turned to other grades of paper. Only four of the original mills remained as newsprint producers. In 1913, more than 95 percent of the newsprint used in this country was produced within our boundaries. By 1952, 17 percent of the newsprint used was produced in the United States and more than 80 percent came from Canada.

Here is an industry where free trade has been tried. Strategic considerations were not vital as our source of supply was moved to Canada, a contiguous friendly country. By all the rules of the free trade theory, we should be happy with the result. A review of congressional hearings since the end of World War II indicates that the Congress has been most unhappy over the results as we have been placed at the mercy of producers who are not subject to our antitrust laws, taxes, or wage rates.

Opposition has been voiced to both the price and the availability of newsprint. Within recent years the following congressional committees have expressed concern with the newsprint situation. The necessity of these investigations should suggest caution in abandoning other industries completely to foreign producers.

81st Congress, 2d session:
Study of Monopoly Power—Newsprint.
Hearings before the Subcommittee on Study of Monopoly Power (Celler committee) of the House Judiciary Committee.

82d Congress, 1st session.
Newsprint investigation.
Hearings before a subcommittee of the House Interstate and Foreign Commerce Committee.

83d Congress, 1st session:
House Resolution 126, introduced by Mr. Wolverton on January 29, 1953, authorizing an investigation of newsprint production. This resolution passed the House March 5, 1953.

FREE TRADE NOT COMPATIBLE WITH GOVERNMENT SUBSIDIES

Another problem which must be faced lies in the fact that the free trade theory is based on individual producers exploiting their comparative advantage without benefit of Government subsidy.

At the present time many foreign producers have plants which were purchased by the United States' taxpayers and furnished them as gifts through the foreign-aid programs. It is questionable whether the American producer should be expected to compete without reasonable tariff protection against this form of subsidy.

As already indicated, England has a two-price system for coal and steel. If industries are nationalized and two-price systems are operated with losses covered by general tax revenues, American producers can hardly accept the theory that they willingly should abandon certain fields to the reputed superior comparative advantage of their foreign competitors.

Certain domestic problems must also be faced in applying the theory of free trade.

If resources are to be shifted within the United States from industries in which we have a low comparative advantage to those enjoying a higher comparative advantage, pressures must be applied to those in the industries to be displaced so as to stop further investment in those industries and to force a relocation of their personnel.

The development of these pressures makes it necessary for us to change two basic tenets of our present political philosophy.

The farm price support program.—In the United States, agriculture is a way of life as well as an economic institution. Both major political parties are pledged to assuring the continued existence of an agricultural economy within the United States.

In fact, the entire farm program including price supports was designed to permit those farmers to remain on the land, who without these aids would have been forced to leave the farm and migrate into the cities and secure industrial employment in those fields where this country does enjoy a high comparative advantage.

Obviously if we adopt free trade we should abandon our entire price support program. If we did not do this, we would be attempting to support farm prices all over the world at the expense of the American taxpayer. As soon as we accept acreage limitation and other similar devices in the farm program, we have departed from free trade.

Labor unions.—In a world operating under free trade, wages are established by those industries having the highest comparative advantage who would bid for labor in a free labor market so as to obtain a labor force sufficient to their needs. In this country unions attempt through collective bargaining to negotiate wage agreements which raise wages in industries having a low comparative advantage to the level of those paid in our more efficient industries. For example, the automobile industry has always been a high wage industry—long before the days of union organization.

Unions in other industries, such as in textiles, have attempted to secure similar wages for their members. As long as a tariff was present this was possible. The abandonment of the tariff would require the abolition of union efforts to secure a uniform American wage based on a so-called American standard of living.

If we abolished our farm program and amended our laws so that unions could not use the pressures of collective bargaining to force employers into paying wages above those prevailing in a given industry located in another country with the same comparative advantage, we would be faced with other problems.

The forces which generate and create migrations of workers from one part of the country to another, as the very theory of free trade contemplates, are extremely painful while they are operative. Even assuming that after everyone had been relocated they would all be much happier, during the process great hardships would have to be endured. Ghost towns would develop.

School teachers, firemen and other municipal workers in these areas would face great difficulties as the local tax base to support them would be destroyed. It is inconceivable that such a trend could develop to any great extent in this country as the people affected would demand relief.

ELIMINATION OF TARIFFS PLACES A FURTHER BURDEN ON THE TAXPAYER

This relief could be a tariff or duty protection for the affected industry, or subsidies or grants-in-aid to the affected community. In this case, the Federal Government pays the local expenses of the community made necessary by the destruction of its tax base.

A proposal to provide direct subsidies from the Federal Treasury to those industries now enjoying or needing tariff protection in lieu of that tariff has been advanced by some exponents of free trade. This suggestion requires critical examination. In the first place, tariff revenues increase Government receipts and the payment of subsidies involves a direct drain on the Treasury.

Inasmuch as the budget is already unbalanced, unless cuts in the foreign aid program could cover the loss of tariff revenue and the payment of subsidies, we would be confronted with the necessity of imposing additional taxes on our own people.

The present tax burden is admittedly too high and this is not a happy prospect. Furthermore, it is essential that sufficient savings be developed to permit a recasting of the entire tax structure so as to restore incentive to our own producers.

Additional Government obligations, accompanied by loss of Government revenues, make it more difficult to correct admitted inequities in the present tax structure.

Howard S. Piquet considers the question of subsidies and the following is taken from page 58 of Aid, Trade and the Tariff:

> One device that immediately comes to mind is direct subsidy. The idea of substituting direct subsidy for restrictive import tariffs has been a favorite with tariff reformers for a long time, but it needs to be considered with extreme caution. The theory has been that once the existence of special favors is brought into the open, such favors will fall of their own weight because of an aroused public opinion. The fact is that the country has so widened the use of subsidies that in many quarters outright subsidies might be viewed as a logical supplement to existing subsidies in other fields. It is not at all certain, therefore, that the substitution of direct subsidies for indirect subsidies in the form of restrictive tariffs, would lead to the elimination of restrictions, as such.
>
> It is conceivable that in a few exceptional cases where industrial adjustment is impossible the Federal Government might directly assume the burden of liquidation indemnities. Such indemnities should not be confused with continuing operating subsidies. Financial payments made in the form of continuing subsidy would tend to perpetuate resistance to adjustment. "Adjustment subsidies," on the other hand, could continue for a stated period, say 5 years, and probably should be made reducible in amount during this period. Their purpose would be to facilitate exit from a certain line of production rather than continuance in that line. Adjustment subsidies would thus be the antithesis of operating subsidies.
>
> Against this approach to the problem of injury occasioned by increased imports it might be argued that indemnification of individuals, firms, or industries for losses sustained because of tariff action on the part of the Federal Government would set a dangerous precedent. Workers and capital displaced by improvements in technology or adversely affected by Government decisions in many fields might be able to show that their difficulties also were brought about "in the larger national interest."

SOME ADVANTAGES OF TARIFFS OVER FREE TRADE

Perhaps the most advantageous feature of a tariff lies in the fact that it requires the minimum of Government personnel and interference with the market mechanism to provide a given level of protection.

It is certainly superior to quotas and similar devices which arbitrarily restrict trade. Direct subsidies are difficult to administer, are subject to abuse and establish a trend which is difficult to check. Certainly few people are pleased with the operation of those subsidies already in effect.

Article I, section 8, of the Constitution directs that Congress shall regulate foreign trade—and shall fix the duties, imposts and excises commonly called tariffs.

Duties or tariffs have long been employed to cause the importer to pay into the United States Treasury the effective difference between the wages, taxes and general cost of doing business here and in the chief competing nation.

The Tariff Commission as an agent of Congress has adjusted this payment. It is money payed into the Treasury of this Nation and may be used to reduce taxes, to pay the national debt or for any purpose that Congress may direct. A subsidy paid to a producer on the other hand is an additional collection from the taxpayers.

TAXATION OF MINING ENTERPRISE, FEDERAL, STATE, AND LOCAL

Tax experts have expressed the following views:

A basic premise of their testimony—almost axiomatic—is that a continuous, dependable, and adequate supply of metals and minerals, most of which are specifically listed by the Federal Government as "strategic and critical," is of paramount importance to the peacetime economy and to national security. Moreover, it is essential from the standpoint of security that so far as practicable minimum reliance be placed on metals and minerals from overseas. This means that so far as possible domestic resources should be developed; and a healthy, expanding "going" domestic mining industry should be encouraged and sustained.

The domestic production of strategic and critical minerals and materials has been in direct competition with the materials produced abroad in areas where not only extremely low wages are paid but where the taxes of producers are universally and substantially lower than the taxes paid by United States producers. Thus the burden of taxes has played a large part in preventiug the exploration for and the development and production of strategic materials in the United States.

If domestic producers are given even part of the tax break given foreign producers United States production would rise and go a long way to making this Nation more self-sufficient.

I. TAXATION—GENERAL CONSIDERATIONS

The problem will be to revamp the tax structure and distribute the burden in a way that will be as sound and equitable as possible and that will insure critical material supplies for our national security.

The hearings [1] describe the attributes of (*a*) a sound and proper tax; and (*b*) a sound and proper tax structure—which may be regarded as a synthesis of the several taxes levied by Government agencies in a given tax jurisdiction. One of the items under (*b*) accepted generally as being valid is—"avoid to the maximum feasible degree impositions that obstruct, retard or injure legitimate and useful industry and business."

Spokesmen from the mining industry feel that their business has a strong case for consideration for these reasons.

1. The unique position of metals and nonmetallic minerals as constituting the life blood of the peacetime economy and the sinews of war.

2. The unique and distinctive characteristics of mineral deposits themselves and of the business of searching for and exploiting such deposits.

3. The peculiar incidence of taxation on the mining business; and the profound influence of the imposition and collection of taxes on the effectiveness with which the mining industry meets the country's need for indispensable metals and mineral commodities.

[1] Hearings, pt. 7, p. 190.

II. NEED FOR A HEALTHY MINING INDUSTRY, INCLUDING INTENSIVE EXPLORATION

The testimony[2] documents the indispensability of metals and minerals. One highly significant paragraph reads:

> *The question of national security.*—The underlying consideration here is the fundamental character of modern war. The power of a nation today, its ability to safeguard its interests, is not measured primarily by its population, its wealth in terms of money, the size of its army and navy nor the extent of its stock of weapons, munitions, and equipment; it is measured more by its capacity for industrialization, and its ability to mobilize its industrial strength. This capacity in turn hinges on the size, competence, and resourcefulness of its technologic, engineering and managerial personnel; on the extent of its industrial plant, using the term in the broadest possible sense to include mines, works, mills, factories, transportation systems, communication systems, et cetera; and the availability of essential raw materials.

The keystone of this last requirement is an adequate supply of metals and minerals.

One of the unfortunate espisodes of recent years was the widespread publicity given to a chart prepared by the United States Bureau of Mines purporting to show the overall position of the United States with respect to domestic reserves of ores. The "supply" from domestic sources of about a dozen of the strategic and critical minerals is shown to be sufficient for less than 20 years; and with respect to five, the period is 4 years or less. The notion that the United States was a have not Nation with respect to minerals became generally accepted.

This simply is not true and it was not so meant by the chart—it was engineers' "jargon" for known reserves that could be mined at a profit. The reason for the gross misunderstanding is that the release of the Bureau was misinterpreted by the public and by many undiscriminating writers.

Trouble arose from the failure to distinguish between "proved commercial reserves" and "latent potential resources". The Bureau referred to reserves; whereas the writers by implication at least attached the figures of "years of supply" to resources. Competent geologic authority and evidence is cited[3] to establish the fact that vast latent though undiscovered, resources must exist in many parts of the United States. There are reasons for the high confidence that these resources are susceptible to discovery largely through improved techniques and apparatus for probing the earth.

The testimony[4] develops two propositions: (1) that exploration, or search for new ore bodies, generally speaking is languishing to a dangerous extent; and (2) that to reverse the trend and stimulate adequate exploration it is necessary to induce the participation of many hundreds of enterprisers. Experience has shown that if prospecting and exploration are left to a few dozen major companies, the results will not be satisfactory. It may be true that the day of the lone prospector roaming the hills with his burro and his pack are outmoded; but the burden must be assumed by the "small" and "medium-size" adventurers if results are to be achieved. The situation parallels that in the oil industry in which partnerships, syndicates, associations, and small corporations, according to the best

[2] Hearings, pt. 7, p. 193.
[3] Hearings, pt. 7, pp. 197–202.
[4] Hearings pt. 7, pp. 204–205.

authorities, have been responsible for finding three-quarters of the new oil pools or fields.

The point to be made is that in any action that the Government may take to build up a healthy and active industry for the exploitation of domestic minerals, the "small" enterpriser must be accorded primary consideration. Incentive for new discoveries must be reestablished—a raised depletion allowance and a flexible duty or tariff would be effective.

III. DISTINCTIVE CHARACTERISTICS INHERENT IN THE BUSINESS OF MINING

This is of particular significance to Government officials responsible for the enactment and administration of tax legislation. Such officials cannot be expected to be familiar with the intricacies of all industries; and mining has more than its share of peculiarities that distinguish it from other sorts of enterprise. It is not easy to describe these to the layman in a few words; and it is even more difficult to indicate the manner in which they bear on the problems of taxation. Interested officials might read the detailed discussion [5] but some of these unusual features will be cataloged briefly.

1. *Extra hazards of the mining business.*—A mining enterprise is subject to various "extra" hazards from which others generally are free. Like other businesses it faces such risks as labor troubles, incompetent management, marketing problems, competition, disaster, etc.; but in addition it involves peculiar risks arising primarily from the vagaries of nature in disposing ore deposits in the ground—geographically and geologically. Initial exploration of a new prospect is risky even if surficial signs suggest the presence of ore. The adventurer must follow many false leads. He rates himself lucky if 1 in 100 likely looking prospects develops into a profitable mining enterprise. In some way the cost of failures must be paid; and if the mining business is to endure the required funds must come from the profits of successful ventures.

Engineers cannot determine accurately in advance and in detail the quantity and quality of the material in an ore deposit. Even after a mine has commenced to operate nature may unexpectedly bring an end to the profitable life of the property. These conditions complicate the problems of appraising the "fair market" value of a mine for ad valorem property taxes; and also were important factors in causing the adoption of "percentage" depletion for the determination of the Federal income tax.

2. *Geography of mining operations.*—The industrial process of removing the ore from the ground and usually the initial treatment of it must be conducted at the site of the deposit, and in the geographic distribution of the deposit Nature has paid no heed to the availability of transportation facilities, fuel, or electric power; to the proximity of sources of machinery, equipment, supplies, et cetera, or of competent operating personnel.

Unlike the typical manufacturing enterprise that purchases its raw materials currently, the mining enterprise, and frequently the community dependent on it, normally cease to exist when the ore deposit is exhausted.

[5] Hearings, pt. 7, pp. 206–209.

3. *Shutdown expense.*—The shutting down and temporary suspension of any industrial operation involves expense, but with a mine this expense is greatly accentuated because of the high cost of maintaining shafts and other underground facilities. Because of the physical cost of shutting down and the hardship caused to the community, operations often are continued even when the profit-and-loss account shows red for the time being.

4. *Limitation of expansibility.*—Unlike the typical manufacturing operation the raw material for a mining enterprise cannot be purchased and brought to the plant as needed. Instead it is in the ground and the rate at which it can be mined is restricted by conditions imposed by Nature. The theater of activity is physically limited in size and operations must be undertaken in sequence. This characteristic underscores the essentiality from the national viewpoint of maintaining overall reserves, that, to the layman may seem excessive; and in having this reserve in many deposits instead of in a relatively few. It emphasizes the need for exploration on an adequate scale and far in advance of the day when the metals and minerals will actually be required.

5. *Need of a "going concern" industry.*—To an unusual degree it is necessary that the mining industry consist of active "going concern" enterprises. This is essential if it is to meet successfully hugely expanded demands that would be put on it by a serious threat of impending war. The business requires highly specialized personnel in management, in engineering and technologic control, and in routine operations. Experience has shown that the time elapsing between demonstration of the existence of the workable ore deposit and production from it on a substantial scale may be 3 to 5 years, or even longer.

6. *Source of "new" wealth.*—Mineral-producing enterprise adds virgin wealth to the economy. New metals and new minerals are the raw materials of most construction, building, and manufacturing. The industry stimulates industrial growth and business expansion; and thereby generates new and greater sources of tax revenue.

7. *Nonrenewability of ore deposits.*—In this respect minerals are unique. A forest can be grown in 50 years; but an ore deposit once depleted is gone for ever.

Every mine eventually is exhausted; and usually in a relatively short time. The removal of each ton of ore depletes the basic capital of a mining enterprise—its ore deposit. An ore deposit is a wasting asset and this unique characteristic has an important bearing on taxation. For example, moneys distributed as dividends are in part true income and in part a distribution of capital.

State and local tax authorities find themselves faced with special and complex problems because of the certainty that any given mine eventually will be exhausted. No other kind of business presents the same difficulties to sound and just taxation.

SUMMARY

The position of those engaged in the business of mining and of those who are potential participants can be summarized in the following propositions:

1. Metals and other minerals are the lifeblood of the peacetime economy and the sinews of war. Lacking adequate mineral supplies, all industry is impotent.

2. Because of the parlous international situation, minimum reliance should be placed on supplies from overseas.

3. Sustained and adequate production depends on the constant maintenance of known and available reserves.

4. Domestic proved reserves (as contrasted with latent resources) are, in general, dangerously low.

5. Latent domestic resources are vast and widespread, principally in the form of "concealed" deposits.

6. Such "concealed" deposits are susceptible to discovery by scientific methods of exploration.

7. Because of the nonrenewability and limited life of every deposit, sustained and aggressive exploration is essential.

8. Exploration for most metals is, in fact, languishing due largely to lack of incentive for exploration, and to stability in the market for the metals found.

9. Effective exploration and development depend on the active participation of many hundreds of private enterprisers, most of whom necessarily will be newly organized and will fall in the category of "small."

10. Mining creates virgin wealth, and in so doing, stimulates all industry, increases employment, expands business, and generates new sources of tax revenue.

11. The business of mining has distinctive characteristics, including extraordinary financial risks that differentiate it from other kinds of business; and warrant special tax treatment.

12. The prospect of financial reward in the mining business is too slim, today, to attract needed venture capital; but modification of tax laws and procedures would greatly brighten this prospect.

13. Only a dynamic mining industry constituted of sound "going concern" enterprises can be relied upon to meet the demands imposed by an adequate program for national security.

14. Wide fluctuations in the price of raw materials adds a special hazard, in that such fluctuations discourage the necessary risk investments which can only be recovered through marketing, over a long period, the minerals discovered through such investment.

IV. IMPACT OF STATE AND LOCAL TAXES ON MINING ENTERPRISE

Exhibits included in the testimony[6] deal with the tax codes and procedures in 25 States in which the exploitation of mineral resources is of substantial importance.

At the outset one is struck with the utter absence of uniformity in the tax structures of the different States as they apply to mining enterprise. Even when two States impose the same types of taxes, details, both statutory and procedural, are likely to vary widely and significantly.

In some States the accepted policy is to impose very high taxes on the ground that the State and its citizens have a kind of vested interest in mineral resources. By contrast is the policy of other States to be lenient taxwise in order to stimulate widespread development. Politics overshadow economics in matters relating to taxation in many States.

One marked tendency is to legislate new kinds of taxes for imposition on the mining industry. Whereas, a generation ago, almost total

[6] Hearings, pt 7, pp. 209, 244.

reliance was placed on the property tax many States now impose 4 or 5 different kinds of taxes. It should be noted, however, that a multiplicity of taxes does not necessarily result in the overall tax burden on a given mining enterprise being higher than the burden the same enterprise would bear in a State having only 1 or 2 taxes. The "new" tax most frequently imposed is the so-called "severance" tax.

Partly in recognition of the chaotic conditions that characterize the administration of the property tax at the county and local level, legislation in recent years has added greatly to the authority and prestige of State tax commissions in many States. Today they function in 41 States and their authority over county assessors and local tax officials has been greatly increased. One of the functions frequently assigned by law to a State tax commission is the appraisal of mineral deposits for the purpose of the property tax.

Four types of taxes on mining enterprise.—Examination of the statutes of the different States discloses a wide variety of legal designations for taxes to which mining enterprise is liable. However, excluding taxes on payrolls and sundry excise taxes, all of the major levies can be placed in 1 of 4 broad categories depending primarily on the "basis" of the tax. The four categories are:

1. Property
2. Income
3. Franchise
4. Severance

The first three are essentially the same as those for any kind of of business; except that the method for determining the assessed valuation of mining property, by statute, may be different from that used in appraising other property. The severance tax applies primarily to mining. The tax is based on the privilege of extracting or severing a natural-resource product from the ground.

Digests of State tax structures.—Each digest lists and describes the various taxes to which a mining enterprise is liable. Included is such information as the method of assessment for the ad valorem property tax; typical rates applicable to mining property; deductions that are allowed in computing the base for the State income tax; the measure used for the severance tax (if one is imposed in the particular State); and the rates established in each instance. The States covered are the following:

Alabama	Michigan	New York
Arizona	Minnesota	Ohio
Arkansas	Mississippi	Oklahoma
California	Missouri	South Dakota
Colorado	Montana	Tennessee
Idaho	Nevada	Texas
Illinois	New Jersey	Utah
Kentucky	New Mexico	West Virginia
Louisiana		

Following the State digests is a discussion of each of the four types of taxes. The salient features are given in table form; the broad features of each are discussed and analyzed; and the advantages of each kind of tax from the standpoint of sound and equitable public finance are set against the disadvantages.

Property (ad valorem) tax.—With the single exception of Oklahoma, each of the listed States levies a tax based on the ownership of the property involved in a producing mining enterprise; and in each the assessed valuation is multiplied by the ordinary mill rate applicable to property in the area where the mine is situated. After a general

discussion of the doctrine involved in the property tax, the arguments in favor of and against the tax as a suitable instrument for taxing mining enterprise are set forth.[7] In the aggregate almost 50 percent of the total burden in 24 States is accounted for by the property tax. It is, accordingly, vitally important that the procedure of valuation for assessment purposes be as valid as possible. This is an exceedingly complex problem because the unmined ore deposits must be appraised. Three different methods are in use for appraising the deposit:

(*a*) The so-called "Hoskold" method; i. e., computing the present worth of expected earnings over the life of the mine.

(*b*) "Negotiation" between the taxpayer and taxing officials. (Shortcomings are glaring.)

(*c*) Use of annual "net proceeds" (or some multiple thereof) derived from the operation of the property.

The advantages and disadvantages of each method are discussed at length.[8] Looking dispassionately into the future, it looks as though the "proceeds" basis for valuation, despite its faults, is likely to be adopted more and more widely. The general proposition that the value of a mine bears some reasonably definite relation to the value of a product that can currently be won from it has a degree of validity. Above all, the method has the merit of clarity and certainty. Discussing doctrines of sound taxation, Adam Smith is quoted as follows:

> A great degree of inequity appears to be not so great an evil as a small degree of uncertainty

This may be an exaggeration; but the principle strongly supports the advocates of valuation measured by annual proceeds. Under it, both the taxpayer and the assessor know where they stand.

Income tax.—Despite the broad principle, advocated by many, that State governments should leave the field of income taxation to the Federal Government, 11 of the 25 States, impose on all corporations taxes specifically designated as "income"; and 5 others levy corporation-franchise taxes that are income taxes in everything but name. In addition, six of the property taxes, applicable exclusively to mining enterprises, specify "net proceeds" or "net profits" as the measure. Minnesota's "occupation" tax on mining is measured by statutory net proceeds and has most of the attributes of an income tax. Except for Minnesota's 12-percent rate (increased from 11 percent in 1949) the rates range from 2 to 8 percent in different States. The following States use net income or net proceeds as the basis for one or more taxes on mining enterprises:

Alabama	Kentucky	Nevada
Arizona	Louisiana	New Mexico
Arkansas	Minnesota	New York
California	Mississippi	Oklahoma
Colorado	Missouri	Tennessee
Idaho	Montana	Utah

Arguments for and against the State income tax as applied to mining are given in detail.[9]

Corporation franchise tax.—Fifteen of the twenty-five States impose an annual franchise tax on all corporations for the "privilege of doing business" in the State; and corporations, whose principal

[7] Hearings, pt. 7, pp. 226–228.
[8] Hearings, pt. 7, pp. 228–233.
[9] Hearings, pt. 7, pp. 234–236.

business is mining, are included. Rates are relatively low; and the tax is not particularly burdensome to the average mining company.

Severance tax.—the most controversial tax is the so-called severance tax that has been legislated into the tax structure of 12 of the 25 States in recent years. The basis for the tax is the privilege of removing or severing "natural resource" materials from the earth's crust. The distinctive characteristic of a true severance tax is that it shall be measured by the quantity produced and shall be computed by applying to such quantity specific rates expressed in dollars and cents per ton, per ounce, per barrel, or other unit. Alternatively the measure may be the gross value of the material removed or severed during the tax period, in which case the rate is a fixed percentage of the money value.

Perhaps because the name "severance" has acquired a sour reputation in mining circles, State legislatures have often avoided putting the tag on their new tax—even though it possesses all the attributes of a severance tax. For example, the following are true severance taxes: (*a*) South Dakota's "ore" tax, (*b*) Utah's "occupation" tax; (*c*) Montana's "metal-mine license" tax; (*d*) Arizona's "sales" tax; and (*e*) Oklahoma's "gross production" tax. On the other hand, Minnesota's "occupation" tax, a subject of heated controversy, has been condemned as a severance tax. It does not, in reality, come in that category.

Opponents of the severance tax point to the fact that the tax is not imposed, ordinarily, as an alternative to the property tax; on the contrary it usually is an additional levy directed against a single industry; and to that extent, is discriminatory.

The arguments for and against the severance tax are recited at some length.[10] The States where some form of severance tax is imposed are:

Alabama	Mississippi	Texas
Arizona	Montana	Utah
Arkansas	New Mexico	West Virginia
Colorado	Oklahoma	
Louisiana	South Dakota	

State tax "structures" and burdens.—A question that naturally arises is this: If a mining property and a corporation owning it could be moved from State to State, how would the total tax burdens, imposed by the different states, compare? By considering two hypothetical enterprises, one "large" the other "small," [11] indices were developed to evaluate the relative burden for each of 21 States. For obvious reasons the States are not identified. The most striking disclosure is the extraordinary range in the total burden as between different States. For example, it appears that the average burden of the three States having the highest levies is more than six times the comparable average of the three States having the lowest levies. The report contains a chart [12] showing the comparisons graphically; and various tables setting forth other significant comparisons.

Aid for the "small" enterprise.—In at least 12 of the 25 States the statutes make specific provision for preferential treatment for (*a*) "small" properties; (*b*) nonproducing properties; and (*c*) unprofitable producing properties. These unquestionably tend to encourage new

[10] Hearings, pt. 7, pp. 236-237.
[11] Hearings, pt. 7, pp. 237-238.
[12] Hearings, pt. 7, pp. 238-239.

enterprise and consequently stimulate exploration and development for the reasons cited.[13]

It would seem that, in the performance of their important duties, State officials responsible for the enactment and administration of tax legislation should reexamine the tax structure in their respective States; and should determine whether the incidence of taxation contributes substantially to one or more of the following conditions:

1. Stagnation in the search for new mineral deposits within the State.
2. Constraint on potential mining enterprisers to select other States (or foreign countries) as theaters of operation.
3. Inefficient operation of mines resulting from undue deferment of mine development.
4. Waste of the State's mineral resources because operators are obliged to mine only the richer ores.
5. Limitation of the Nation's overall domestic supply of needed mineral commodities.
6. Stifling, in general, of a basic industry that, as it expands, generates new business and industrial activity of every kind within the State.
7. Restriction of the State's aggregate tax revenues by limiting and narrowing the tax base (the direct consequence of (6) above).

The foregoing must, of course, be viewed in the light of the following:

(*a*) The special characteristics that differentiates mining from other kinds of business; and

(*b*) The recognized importance of a healthy domestic mining industry as the primary source of commodities uniquely vital to national security.

If it appears that the impact of existing taxes contributes, in significant degree, to 1 or more of the 7 conditions listed, revision of the tax structure should be undertaken in the common interest of the State.

V. THE FEDERAL INCOME TAX AND MINING ENTERPRISE

For any reasonably successful mining company in a reasonably prosperous year, the Federal income tax looms as an element of major importance in its financial performance. The fact cannot be otherwise, for the simple reason that the tax amounts, in 1954, to 52 percent of the "net" income (if above $50,000), as defined by the Federal Income Tax Code.

Of course, the measure and the rates of the income tax, nominally at least, are uniform for all taxpayers, under similar conditions and circumstances, irrespective of the business in which they are engaged. Almost every organized group of taxpayers argues vigorously that the public interest would be served by a reduction in its particular taxes.

However, from the point of view of the Treasury Department any measure or procedure that would reduce the current revenue obtained from any group of taxpayers (those engaged in mining, for example) would, coincidentally, increase the tax burden on every other group of taxpayers. It can, of course, be argued that a judicious "adjustment," that sacrifices a little revenue at the outset, later will generate a new bases of taxation and thereby eventually swell tax revenue. However, proof of this is not always easy, and, for reasons that are understand-

[13] Hearings, pt. 7, pp. 240-241.

able, Government officials are reluctant to lose assured current revenues. Only a highly convincing argument that "relief" is in the public interest is likely to gain their support.

The testimony [14] outlines the background against which spokesmen for the mining industry contend that special consideration for their business, income-tax-wise, would promote the public welfare, with emphasis on national security. Without restating this background, it can be reiterated that any removal or mitigation in existing deterrents to engaging in the business necessarily will encourage and stimulate the flow of venture capital needed for exploration and the subsequent phases of domestic mineral exploitation. The report goes on to describe the position of the individual adventurer and investor under sundry typical hypothetical conditions, and shows the impact of the income tax under existing conditions on his potential take-home profits. Next are given examples of the impact of income taxation on "large" and "small" corporations that are potential investors in "new" mining ventures. Various conditions and outcomes are assumed, and the financial results under each are analyzed.

In general, the position of those who urge consideration of changes, either in the Federal Income Tax Code itself, in the interpretation of the statutes, or in administrative regulations, both substantive and procedural, can be summarized briefly as follows:

1. That any mining venture is surrounded with unusual hazard.
2. That the only compelling incentive to launch a new enterprise is the possibility of financial reward commensurate with the risk.
3. That, under the existing code and procedure, the potential adventurer is faced with two obstacles: (*a*) If the venture is a failure, he is circumscribed in balancing his losses against other income or capital gains; and (*b*) if the venture is a success, a large proportion of the financial fruits must be surrendered in the form of income taxes. Consequently the inducement is small to engage in the business.

There follow nine specific amendments to the Tax Code or administrative regulations that have been proposed by spokesmen for the industry. The report describes these in some detail, sets out the arguments used by advocates, and notes the objections raised by critics—primarily officials of the Internal Revenue Bureau. In this abstract the general principles involved will be outlined; and reference will be made to the appropriate pages in the report itself. Of the 9, the first 7 relate directly to a company engaged in the mining business whereas the eighth and ninth relate to individual shareholders in such companies—typically persons of substantial means.

1. *Deferment of income taxation until invested capital has been recouped—in full or in part.*—This proposal is patterned after a Canadian statute which provides that operators of metal mines and "strategic mineral" mines shall be exempt from tax on the income derived from such mines during a period of 36 months after the date of "going into production in reasonable commercial quantities." The act provides that this date shall not be more than "6 months after the commencement of milling or shipping, as the case may be." The 6-month interval is regarded as a reasonable period for "tuning up" the new plant.

[14] Hearings, pt. 7, pp. 246-249.

Advocates of legislation of this sort point out that it recognizes the principle that until a mining adventurer recovers his original "stake" he actually has no true income to tax. It recognizes the characteristics peculiar to the industry and the hazards involved.[15]

2. *"Expensing" of the cost of development, research, etc. rather than capitalizing as a depletable asset.*—By "expensing" is meant the privilege of directly charging off the expense, either currently or as a deferred cost to be spread over future years as ore is extracted. In either event the taxpayer benefits by reducing his taxable income. If he is compelled to capitalize the expense as a depletable item he "loses" the benefit under the operation of "percentage" depletion. The principal expenses involved are those incurred for blocking out, undercutting, developing, and stripping the ore body. The Internal Revenue Bureau regards the procedure as being, in essence, the equivalent of the practice of the oil and gas industry of writing off "intangible drilling and development expenditures" as an operating expense. The Treasury is not reconciled to the validity of this procedure proposed by the industry with respect to oil and gas; and it is only being consistent when it opposes the modifications in the law sought by the mining industry. That industry, by the same token, says it is being discriminated against in favor of the oil industry.[16]

3. *Extension of "carryover" periods for "averaging" incomes.*—All taxpayers, individuals as well as corporations, have the privilege, in computing income-tax returns, of using the device known as "carry-back" or "carry-forward" of net losses. The purpose is to permit the "ironing-out" of the effects of fluctuation of income from year to year. Operative in 1950 was a carry-forward of 3 years and a carry-back of 2 years. The Treasury proposed, respectively, 5 years and 1 year; but the taxpayer in the mining industry argued for 5 and 2.

4. *Repeal of the tax on intercorporate dividends and the penalty tax on consolidated returns.*—The Income Tax Code, as it exists in 1950, provides:

> (*a*) That a corporation receiving dividends from another corporation shall include 15 percent of such dividends in computing its taxable income.
>
> (*b*) That a corporation, making a "consolidated" tax return for its subsidiary or affiliated corporations and itself, shall be subject to an income-tax rate 2 percent higher than that to which it otherwise would be liable.
>
> Agreement is general, even in Government circles, that both provisions should be repealed.

5. *Modification in practice regarding allowances for depreciation.*—All industrial enterprise using physical plant (the term "including structures, machinery, and equipment of various kinds") that is subject to wear, tear, deterioration, and obsolescence is concerned with the deduction for depreciation permitted in computing taxable income. There is no true profit in such enterprise unless the cost of exhaustible capital assets, represented by such plant, can be recovered "tax free," so to speak. The most simple plan is to deduct the full cost in equal annual installments over the useful life of the facility.

Because of sundry peculiar characteristics inherent in the mining business (extraordinary hazards, rapid changes in methods of ore bene-

[15] Hearings, pt. 7, pp. 254-255.
[16] Hearings, pt. 7, pp. 255-256.

ficiation, and erratic financial results from year to year), the industry seeks the widest latitude in charging off depreciation. One proposal is this:

That the taxpayer engaged in mining be permitted to use in any year any depreciation rate that he may elect, provided the deduction for such year does not exceed 25 percent of the original cost of depreciable property. This would permit either: (*a*) deferring depreciation deductions until the business is making a profit if "hard sledding" were encountered in the first few years; or (*b*) taking heavy depreciation in early years in the event that profits were particularly good during that period.[17]

6. *Modification in practice regarding allowance for depletion.*—An underlying doctrine of the income tax is that the object of taxation shall be income as distinguished from capital or property. The depreciation allowance is a device for amortizing assets represented by plant, machinery, equipment, and other physical facilities.

The depletion allowance is a device for amortizing the primary asset of a mining enterprise—namely, the ore deposit. In both instances, the exhaustible capital should be recoverable free of tax.

Mining experts don't question the validity of the depletion principle as applied to mine taxation; but exception sometimes is taken to the use of "percentage" depletion; and particularly to the rate (27½ percent) enjoyed by the petroleum industry.

By "percentage" depletion is meant the allowance of a statutory percentage of gross income, taken year after year without reference to the original cost or value of the ore body being depleted. The exhibits included in the testimony trace the evolution of the practice relating to depletion, beginning in 1913. It is a highly technical matter; but the fact is that the fixing of a depletion rate, applicable to most metal as well as to nonmetallic mining, had a sound basis in experience and was not "taken out of the air." There is no reason why the depletion rate on minerals should not be the same rate as that set for petroleum. For reasons explained in the testimony it is the only method that is practical from the standpoint of administration. Taken in conjunction with the "dual" limitation of "50 percent of net" the allowance, over a period of years, is fair and equitable according to spokesmen for the industry; and in the aggregate the revenues accruing to the Government from the mining business are not less than they would be under earlier methods of determining the depletion allowance.

Several proposals have been made by representatives of the industry dealing with certain phases of depletion and a number of these have been described in the hearings. They involve controversial and technical questions and will be mentioned only briefly here.

A. Reexamination of percentages of gross and net income. The most practical suggestion is that the limitation of "50-percent of net" be abandoned; and that the statutory percentage of gross alone govern the computation.[18]

B. Redefinition of "Net income from the property." The purpose is to provide certainty and clarity as to the deductions that must be made in determining the "gross" income to be used in computing percentage depletion.

[17] Hearings, pt. 7, pp. 257-258.
[18] Hearings, pt. 7, p. 259.

C. Redefinition of a "mineral property." Here again the objective is to attain clarity and certainty with respect to the combining of neighboring or contiguous properties for computing depletion allowances.[19]

D. Recognition of percentage depletion in computing "carryovers" of net operating losses. The point involved here is the distinction between "percentage" depletion and "cost" depletion. Usually the former is greater for a given year. The present procedure (disallowing percentage depletion in the year to which a loss is carried over) has the effect of denying the taxpayer either the benefits of percentage depletion to which he is entitled; or the benefits of the "carryover."

E. Application of depletion provisions to tailing-piles and slag dumps.

As a consequence primarily of progress in the technology of beneficiating ores and recovering metals a great many old mill tailing piles and smelter slag dumps are being reworked. These accumulations of once-treated material are potential sources of substantial quantities of valuable metals and minerals.

The industry contends that income arising from exploitation of tailing piles and slag dumps should be accorded the same treatment as income derived from newly mined ore.

7. *Deduction of costs (losses) of exploration that proves to be fruitless.*—At present, expenditures for exploration and initial development that do not prove successful can be deducted from current taxable income only if the property involved in the exploration is definitely abandoned. In effect this means the property must be sold, a procedure that often is not feasible. The industry seeks a simple and clearcut provision whereby the cost can be effectively deducted from income, that otherwise would be taxable, when the failure of an exploration project or the worthlessness of the exhausted mine has been established.

8. *Deduction of losses in the individual income tax of a shareholder.*—Of primary importance to the individual who owns or is considering the purchase of stock in a company engaged in the mining business, would be the privilege of deducting in full, from ordinary income, the amount of a long-term capital loss sustained by him through the failure of an exploration project or program that renders his shares worthless.

The Treasury Department is planning to recommend changes in the statutes with respect to capital losses and gains. The Department might feel justified in recommending legislation of this type that differentiated between worthless stock in a mining company and worthless stock in any other kind of company. Such differentiation presumably would be predicated on the distinctive characteristics of mining, the pressing need for stimulating exploration, and the public interest in furthering a secure position with respect to the Nation's metal and mineral resources.[20]

9. *Amelioration of "double taxation" of a corporation engaged in mining and its shareholders; and "extending" benefits to the shareholder.*—Under present law, an individual must include the full

[19] Hearings, pt. 7, pp. 263-264.
[20] Hearings, pt. 7, pp. 265-266.

amount of dividends received from domestic corporations (including those engaged in the business of mining), in computing his taxable income. The corporation that pays the dividend already has paid a tax on its income, which income was the fruit of the same industrial activity as was the portion of the shareholder's income represented by the dividend. The Treasury has given, and still is giving, consideration to some fiscal device by which to ameliorate the recognized anomaly of "double taxation."

The report discusses six alternative methods being considered by the Treasury Department to achieve this objective. It also outlines two specific proposals related to "double taxation" that might be applied exclusively to the mining industry. The basis of this preferential treatment would be the "wasting-asset" character of the mining business. The proposals follow.

A. *Recoupment of invested capital by shareholders.*—A statute would be enacted in substance as follows:

> For the purpose of determining his taxable income, a shareholder in a company deriving its income directly from mining operations would be allowed to deduct 20 percent of any dividends received from such company as "capital return" or "depletion".

If it were found desirable it would of course be possible to put a statutory limitation on the amount of recoupment (*a*) by limiting the aggregate allowance to the actual amount of the individual's investment; (*b*) by reducing the annual percentage to something less than 20 percent; or (*c*) by imposing a limit as to the number of years, after the commencement of dividend payments, for which deduction could be made.[21]

B. *Extension of benefits of depletion allowance to shareholders.*—Under prevailing tax practice only in greatly diluted form do the benefits of depletion allowance reach the "ultimate" risk taker—the individual investor or shareholder. The matter involves complex technical details; but the principle can be stated simply: Spokesmen for the industry contend that such allowances as are made to the corporation itself for the computation of its tax, either on the basis of discovery depletion or of percentage depletion, should properly be extended to the shareholder. They argue that any other procedure prevents the stockholder from realizing the equitable allowance representing the exhaustion of his economic interest in the mining property. Under such a plan the corporation would designate the portion of any dividend represented by depletion (usually percentage depletion) as a distribution tax free to the shareholder who receives it. It should be remarked that any such proposal evokes the most vigorous dissent from the Internal Revenue Bureau and the Treasury Department.

Summary regarding the Federal income tax

This final section of the testimony concludes with 10 concise statements that recapitulate the premises and summarize the reasoning that would appear to move the Congress to make an intensive study of the impact of the Federal income tax on the domestic mining industry.[22] The substance of three of these statements follows:

[21] Hearings, pt. 7, p. 267.
[22] Hearings, pt. 7, p. 269.

1. Those intimately familiar with the mining business contend that the most efficient and effective method of attaining needed expansion in exploration, development, and production—and the most economical from the standpoint of taxpayers, in general—is modification of sundry provisions of the Federal Income Tax Code that today deter potential suppliers of the necessary risk capital from launching new mining ventures.

2. The only alternative (assuming that the Government does not itself engage in the business on a huge scale) is direct subsidization, in some form, by the Federal agencies. The Treasury and the Congress are familiar with arguments in favor of, as well as the cogent objections to, various types of direct subsidy.

3. It would seem that it is the duty of both the Treasury and Congress to reexamine the impact of the income tax on the mining industry. If, by feasible and just changes in the Tax Code or in the practices of administration, the business of discovering and exploiting deposits of metals and minerals can be stimulated, such changes are distinctly in the public interest.

NOTE.—The hearings [23] include 2 glossaries—1 for mining terms and 1 for tax terms—that may prove useful to those who are not familiar with technical terms used by specialists in either of these fields.

NOTE.—The office of the Defense Mobilization reports that 28,126 tax-amortization applications had been filed by June 23, 1954. The total value of these applications is $42,229,986,000. Of the total filed, 19,129 certificates have been granted. These certificates amount to $29,346,861,000. The average percentage of these certificates is 60 percent. The period of amortization covered by these certificates is 5 years.

[23] Hearings, pt. 7, p. 270.

TARIFFS, FOREIGN TRADE, AND RELATED PROBLEMS AFFECTING CRITICAL AND STRATEGIC MATERIALS

The following study is the expression of views of tariff experts and certain industry leaders for the benefit of the committee's consideration:

The study of accessibility of critical raw materials obviously includes within its scope the factors of tariffs, trade policies, and monetary and exchange practices not only of the United States but also of foreign nations, since these have a bearing on the ability of the United States to produce domestic strategic and critical raw materials which we require in time of war, for our expanding domestic economy and for national security.

These factors also have a strong bearing upon the dependency of the United States on foreign supplies of such critical materials.

These factors include the policies on customs duties or tariffs, currency value manipulations, and artificial multiple convertibility of currency and also include such restrictive measures as quantitative controls imposed on imports and exports, nationalization of property rights, state trading, and various inflationary programs resulting from devaluation of currency and allocation of materials.

ECONOMIC APPROACH TO TARIFF AS OPPOSED TO FOREIGN POLICY APPROACH

The regulation of foreign trade through the adjustment of the duties or tariffs was delegated to Congress in accordance with article I, section 8 of the Constitution. Upon the passage of the 1934 Trade Agreements Act Congress transferred such responsibility to the executive branch.

This responsibility was formerly exercised through the Tariff Commission, an agent of Congress, on the general basis of fair and reasonable competition—the difference between the effective wages, taxes, and other important production factors here and in the chief competitive country was the principle upon which the tariff rate was determined.

Without going into detail it should be pointed out that from the passage of the first revenue and tariff act by the Congress of the United States, July 4, 1789, to June 12, 1934, when the so-called Trade Agreements Act was passed in the form of an amendment (sec. 350) to the Tariff Act of June 17, 1930, trade and tariff problems were handled by the Congress in accordance with article I, section 8 of the Constitution.

According to the testimony in the 20-year period since passage of the Trade Agreements Act, practically all trade and tariff administration, including the regulations of commerce with foreign countries, has been interwoven with general foreign policy with emphasis on military and political considerations. Administration has been almost completely under the control of the State Department, which, having control of tariffs and trade under the 1934 Trade Agreements Act as extended, has gone far beyond the intended bilateral trade agreements, and attempted to transfer control over these matters to an International Trade Organization (ITO). This attempt was rejected by Congress.

The proposal was withdrawn by the State Department but later revived in the form of the General Agreement on Tariffs and Trade (GATT), the international aid program fostered by the United Nations Social and Economic Council and developed under the Marshall plan and Economic Cooperation Administration and finally, the mutual security program.

International planning of trade matters by these State Department controlled operations has been related to international political considerations much more closely than to domestic economic and strategic security needs. There are many who say such international planning has fostered the "Dollar Gap Hoax," the "Trade not Aid" slogan and other false ideas and theories designed to favor the foreign over the domestic producer.

INCREASE IN IMPORTS OVER PAST 20 YEARS—65 PERCENT ON DUTY-FREE LIST

During the recent 20-year period, an average of about 65 percent of all imports into the United States have been on the duty-free list. At the same time, dollar value of imports of dutiable commodities have increased from $529 million in 1933 to an average of $4.72 billion during 1951–53 or 8.9 times as great as when the foreign policy program was first introduced.

Two outstanding developments must be noted in this connection: (1) Prices or unit values of imported commodities measured by means of index numbers, have increased from an average of 77 in 1933 to an average of 291 in 1951–53. (Base 1936–38 average equals 100.) This is an indication of the extent to which inflationary programs have been introduced, for unit values or average prices of all imports are now nearly 4 times higher than in 1933, and 3 times higher than they were in the base period 1936–38. Thus the increase in total value of imports is more a measure of inflation in the unit value of imports than a favorable indication of progress or improvement in foreign commerce under the (Reciprocal) 1934 Trade Agreements Act.

(2) The second outstanding feature of this period is the fact that the ratio of customs duties collected to value of imports has been reduced from 19.8 in 1933 to only 5.3 percent in 1952—a reduction in tariff ratio of 73 percent. This was double the rate of decrease in average tariff rates when contrasted with 40 leading countries outside of the United States.

EXHIBIT A.—*Imports into the United States, total dutiable and free duties collected and average ad valorem rates of duty on dutiable and on total imports price index numbers, 1933–52, inclusive*

Year	Value of imports (millions of dollars)		Percent free	(Millions of dollars)		Prices index numbers 1936–38=100		Ratio duties to value of imports	
	Total	Free		Dutiable imports	Duties collected	United States wholesale	Imports	Dutiable	Free and dutiable
1933	1,433.0	903.5	63.1	529.5	283.7	80.5	77	53.6	19.8
1934	1,636.0	991.2	60.6	644.8	301.2	91.5	88	46.7	18.4
1935	2,038.9	1,206.0	59.1	832.9	357.2	97.7	90	42.9	17.5
1936	2,424.0	1,384.9	57.1	1,039.0	408.1	98.7	96	39.3	16.8
1937	3,009.9	1,765.2	58.6	1,244.6	470.5	105.4	108	37.8	15.6
1938	1,949.6	1,182.7	60.7	766.9	301.4	96.0	96	39.3	15.5
1939	2,276.1	1,397.3	61.4	878.8	328.0	94.1	98	37.3	14.4
1940	2,540.7	1,649.0	64.9	891.7	317.7	96.0	105	35.6	12.5
1941	3,222.0	2,030.9	63.0	1,191.0	437.8	106.6	112	36.8	13.6
1942	2,769.3	1,767.6	63.8	1,001.7	320.1	120.6	130	32.1	11.6
1943	3,390.0	2,192.7	64.7	1,197.2	392.3	125.9	141	32.8	11.6
1944	3,877.9	2,708.4	69.8	1,169.5	347.3	127.0	151	29.7	9.0
1945	4,086.0	2,737.3	67.0	1,348.8	380.8	129.2	156	28.2	9.3
1946	4,792.1	2,897.7	60.5	1,894.4	498.0	147.9	173	26.3	10.4
1947	5,643.3	3,431.7	60.8	2,211.7	445.4	185.7	213	20.1	7.9
1948	7,091.7	4,174.1	58.9	2,917.7	417.4	201.6	235	14.3	5.9
1949	6,591.6	3,883.2	58.9	2,708.5	374.3	189.3	224	13.8	5.7
1950	8,743.1	4,766.8	54.5	3,976.3	529.6	197.2	243	13.3	6.1
1951	10,817.3	5,993.4	55.4	4,823.9	603.5	220.2	305	12.5	5.6
1952	10,744.6	6,256.9	58.2	4,487.7	574.7	214.5	289	12.8	5.3
1953 [1]	10,887.1	6,048.9	56.0	4,838.2	612.6	----------	279	12.7	5.6

[1] Fiscal.

EFFECT OF INFLATION ON TARIFF RATES

The tremendous inflationary movement in terms of prices of imports (141 percent of the inflationary movement in the United States wholesale index $\frac{1952}{1933}$) occurred simultaneously with negotiation of bilateral trade agreements and the later general agreements grouped under General Agreements on Tariffs and Trade (GATT). Exhibit A shows the increase of imports year by year from 1933 through 1952, and the proportion which entered free of duty, the ninefold increase in dollar value of dutiable imports (which accompanied the inflationary movement in all foreign countries combined) parallel to the 73 percent reduction in average ratio of duties to imports (see exhibit A, p. 71, hearings, pt. 7).

The complete Tariff League investigation which may be referred to as publication No. 133, by the American Tariff League, is likewise offered for the record at this point, and is marked exhibit D (see p. 72 of hearing, pt. 7).

TRADE AND TARIFF POLICIES WHICH DISREGARD COMPARATIVE WAGE AND LIVING STANDARDS TEND TO MAKE UNITED STATES DEPENDENT UPON FOREIGN NATIONS FOR OUR SUPPLY OF STRATEGIC AND CRITICAL MATERIALS

It seems desirable at this point to refer briefly to the wage situation which exists in practically all foreign countries for which reasonably satisfactory data are available. (Canada alone stands out as most nearly comparable with conditions in the United States.)

Present tariff rates, particularly on mineral products, do not reflect the difference in labor cost in the production of foreign minerals and strategic materials as compared to the labor costs under the high standard of living in the United States. As a result many of the mining properties in the United States engaged in producing strategic and critical materials have been forced to close, leading to unemployment, lost mining and related industrial activities and ghost towns in the producing areas. The company or organization has a choice upon stopping production—either standby costs, including pumping—or abandoning the investment, in which case the mineral is often lost forever to the Nation or opened later at tremendous expense.

WAGE GAP

A second economic research study, just released and made available for inclusion in this connection, by the American Tariff League above referred to, under the title "What About the Wage Gap?" presents interesting data on wage differences. See publication No. 134 of the American Tariff League, here offered as exhibit (2) (see p. 73, hearings, pt. 7).

Table I (p. 75, hearings, pt. 7), of that study, presents comparative average hourly earnings for industrial workers in the United States and in a group of 13 selected foreign countries. This table shows the average hourly earnings for industrial workers in the United States (October 1953) as $1.78. The average hourly wage for Canada was $1.38, or 40 cents less than in the United States.

The average for such countries as Sweden, Norway, Switzerland, Belgium, United Kingdom, France, and Germany ranged from 75 cents per hour down to 37 cents per hour. Other foreign countries such as New Zealand and Argentina come in an intermediate group, while average hourly earnings for industrial workers in Japan for the year 1952 were only 19 cents per hour or less than 11 percent of the average earnings in the United States.

The wage gap has widened during the period that inflation in the price of imports has exceeded inflation in our domestic wholesale price index. This fact is of extreme importance in considering the question of our tariffs on critical and strategic minerals and materials. The ability of our domestic mines to compete with foreign production has been comparatively reduced during the same period that tariffs on imports were drastically reduced.

COMMENTS ON REPORT TO PRESIDENT AND CONGRESS BY THE COMMISSION ON FOREIGN ECONOMIC POLICY

During the first session of the 83d Congress, at the time that extension of the Trade Agreements Act was under consideration, provision was made for the creation of a Commission on Foreign Economic Policy. This Commission was promptly organized and has completed its report to the President and the Congress. The report and the numerous dissents and a special minority report are now available in printed form. Reference is made to report to the President and Congress by the Commission on Foreign Economic Policy, including minority reports, under date of January 23, 1954.

We are advised that there is now on the press a comprehensive supplementary report containing digests or abstracts of the data

considered by the Commission, prepared by members of the staff of the Commission. This supplementary digest apparently will be a document of considerable size and it seems best to merely make reference to it as an exhibit.

The Commission on Foreign Economic Policy held a number of public hearings and many different interested groups were invited to appear and present evidence on the economic problems involved in foreign trade, including tariffs, import and export controls, currencies, foreign exchange rates, inflation, devaluation, and the many methods employed by foreign nations for trade advantage.

The American Tariff League was invited to appear, an organization to which reference has already been made. Inasmuch as that organization has been engaged in research on this subject for many years, it seemed to them wise to present their findings in a separate report for consideration by the Foreign Economic Policy Commission, the Congress, and the public. That study is being made available to the public at the time this committee is engaged in its analysis of the various problems covered in that report. The study referred to is titled "Strength at Home," the American Tariff League, Inc.

We have included this report or study by reference only, since it has been made available for general use.

The relationship of these two reports to the work of this committee created under Senate Resolution 143 is apparent, dealing as they do with questions affecting accessibility of critical raw materials to the United States during a time of war, and methods of encouraging exploration and development of the supply of such critical raw materials "adequate for the expanding economy and the security of the United States."

POPULATION AND QUANTITY OF IMPORTS, BY ECONOMIC CLASSES, 1933-52, INCLUSIVE

The population increase factor during the 20-year period since passage of the Trade Agreements Act in 1934, has been a large element in the increase of imports, one in addition to the factors of inflationary prices and tariff reductions. Exhibit E, page 85, part 7, shows that the population of this country has increased about 25 percent during the 20 years under discussion.

If conditions had been entirely normal, it may be assumed that the physical quantity of imports, as distinct from value, might have increased at approximately the same rate as the population increase. In other words, the quantity of imports might have increased about 25 percent. The period 1933-52 was probably the most abnormal period in the last century. First there were the depression years at the beginning of this period, and from exhibit E it will be seen that the index number of quantity of imports fell to about 75 percent of normal. Normal quantity of imports did not again reach the index number 100 until 1941, the beginning of World War II. The extra quantity of imports during the past 10 years resulted principally from requirements of this country during the period of World War II, followed by the period of the cold war (including the Korean episode) which involved extraordinary imports, particularly of raw materials, for stockpiling purposes.

As already noted, population increased about 25 percent from 1933 to 1952, while quantity of all imports increased to an index number of 146 in 1950, 144 in 1951, and 151 in 1952, (using the base period 1936–38 as the base period equal to 100).

Part of this increase in quantity of imports (again, as distinct from value) might very well represent substantial raising of the standards of living in this country, aside from the stockpiling and war activities, and aside from price increases and tariff decreases.

Exhibit E also presents index numbers of quantity of imports of each of the five major economic classes of products. It will be noted that in the case of crude materials the physical quantity of imports (measured by index numbers), went up from 87 percent of normal in 1933 to 140 percent of normal in 1946, which was the first full year after World War II. Quantity of crude materials imported then declined to 125 percent of normal in 1949, which, as already indicated, is almost exactly the same as population increase. During 1950, 1951, and 1952, during the Korean episode, the physical quantity of imports of crude materials went up to an average of about 150 percent of normal.

Since exhibit E presents similar data for crude foodstuffs, manufactured foodstuffs, semimanufactures and finished manufactures, for each year since 1933, these need not be presented in this summary except to note that just as the quantity index for all imports went up from 82 percent in 1938 to 151 in 1952, so also the index number of finished manufactures went up from 83 percent in 1938 to 150 in 1952.

From this analysis it appears that (aside from price increases and reduction in rates of tariff) population increase and recovery from the depression period together with relatively higher living standards, have combined to bring relative quantity of imports to the highest level in American history. The extent to which dependence on imports has resulted in failure to use domestic natural resources and American labor to supply increased demand due to population and standard of living increases, and to provide adequately the strategic and critical materials needed for national defense and public security, is generally indicated in the degree which import indexes exceed population index numbers presented in exhibit E. Some raw material industries have been materially reduced in their productive capacity during this 20-year period, due to tariff reductions and adverse tax treatment.

EXHIBIT E.—*Population and quantity of imports by economic classes, 1933–52, inclusive*

[1936-37-38=100]

Year	Population		Total	Index numbers of quantity of imports				
	Total (in thousands)	Index		Crude materials	Crude foodstuffs	Manufactured foodstuffs	Semi-manufactures	Finished manufactures
1933	125,579	96.7	76	87	74	69	73	72
1934	126,374	97.3	75	80	77	80	65	74
1935	127,250	98.0	92	96	104	88	87	87
1936	128,053	98.6	102	102	107	99	102	102
1937	128,825	99.2	114	114	107	110	118	117
1938	129,825	99.9	82	81	83	89	79	81
1939	130,880	100.7	94	95	95	92	100	88
1940	131,936	101.6	99	118	97	85	104	74
1941	133,058	102.4	117	155	104	90	128	72
1942	133,752	103.0	87	106	72	57	102	72
1943	133,971	103.1	97	93	112	81	104	94
1944	132,622	102.1	105	91	146	98	106	94
1945	132,137	101.7	107	97	116	83	137	103
1946	139,893	107.7	113	140	108	79	123	90
1947	143,375	110.4	108	129	96	83	130	84
1948	145,045	112.4	123	139	109	91	149	109
1949	148,559	114.4	120	125	119	97	142	101
1950	151,240	116.4	146	152	113	117	219	128
1951	154,360	118.8	144	142	119	122	200	134
1952	156,981	120.8	151	151	118	128	206	150

The committee has presented index numbers of quantity, unit values or prices, and total values of all imports. In testimony and exhibits it was shown that according to a recent tabulation made by the United States Tariff Commission (September 1953), based on the classification shown in Tariff Commission reports (1952), there were a total of 3,337 rates of duty of dutiable items affected by trade agreements. (See Commission report, table 8.) Of these, in 2,532 cases rates of duty were reduced in 148 cases preagreement rates were bound, and in 657 cases no concessions were granted; in no case were rates of duty increased.

It is estimated that there are nearly 1,700 commodities on free lists. This makes a total of about 5,000 classifications covered by duties or appearing on free lists.

QUANTITY AND VALUE OF IMPORTS

(A) Of all commodities;
(B) of the 50 leading commodities; and
(C) of the 15 leading natural resource products, 1949 and 1951.

In an exhaustive study made by the United States Chamber of Commerce in 1950 (tables F and G, p. 88, pt. 7) it appears that of total imports in 1949, valued at $6,591,600,000, the leading 50 items were valued at $5,242,356,000, or 80 percent of the total for all imports. According to a supplementary study for 1951, total value of imports were valued at $10,817,300,000, while the leading 50 items were valued at $8,045,601,000, or again 80 percent.

When natural resource materials are segregated, the 15 leading natural-resource items had an import value in 1949 of $1,418,883,000, or 27.1 percent of the 50 leading items. This had increased to $1,670,538,000 in 1951, or 21 percent. 1951 was, however, a year

in which many raw materials were withheld from this country, due to world prices being higher than domestic ceiling prices. Example: Zinc 30 cents foreign, 19.5 cents domestic.

IN CAMPAIGNS FOR HIGHER OR LOWER TARIFFS OR FREE TRADE—40 YEARS, 1911 TO 1951

On the average, during the period 1911–51, value of imports classified on the free list has averaged about 65 percent of total—going below or above that figure by more than 10 percentage points in only 3 years out of the last 40.

During the 145 years prior to 1934, our foreign trade and tariff policy was based entirely upon acts of Congress within the limitations set out in article I, section 8, of the Constitution, having in mind full consideration of domestic industry in the light of natural economic laws of supply and demand. Gradually, after about 1910, when our national debt fell to only about $1 billion, the Nation as a whole came to depend less upon foreign countries for investment funds and liquid capital. Government fiscal and monetary and foreign exchange policies commenced to displace or supplement economic laws of supply and demand. The National Treasury began to depend upon other forms of revenue than customs duties or tariffs. Also, beginning about 1910, our national life became increasingly involved in foreign political and military conflicts, participation in which was controlled largely by our State Department with ever-increasing emphasis on foreign relations rather than domestic considerations. The Trade Agreements Act in 1934 was a development in this trend.

Additional comment in the form of a short table is offered for inclusion at this point as exhibit D, which follows. In this exhibit a number of very close relationships may be detected as between (*a*) free list percentages, (*b*) price index numbers, and (*c*) ratios of duties collected to import values based upon dutiable imports, and upon free and dutiable imports combined. (See exhibit D, which follows.)

It will be noted (in exhibit D) that wherever index numbers of prices have moved up, the ratio of duties to values has moved down. It is equally true that wherever index numbers of prices have moved down, the ratio of duties to value of imports has moved up. And these movements have corresponded very closely.

EXHIBIT D.—*Percentage of imports entered free of duty; price index numbers; and ratios of customs duties; value of dutiable imports and value of all imports: Contrasting 2 periods, 1911–30 and 1931–50*

Year	Imports (percent free)	Price index numbers 1926=100	Ratios, duties to import values		Year	Imports (percent free)	Price index numbers 1926=100	Ratios, duties to import values	
			Dutiable	Total free and dutiable				Dutiable	Total free and dutiable
1911	50.8	64.9	41.3	20.3	1933	63.1	65.9	53.6	19.8
1912	53.7	69.1	40.2	18.6	1934	60.6	74.9	46.7	18.4
1913	55.9	69.8	40.1	17.7	1935	59.1	80.9	42.9	17.5
1914	60.4	68.1	37.6	14.9	1936	57.1	80.8	39.3	16.8
1915	62.7	69.5	33.4	12.5	1937	58.6	86.3	37.8	15.6
1916	68.6	85.5	30.7	9.6	1938	60.7	78.6	39.3	15.5
1917	69.5	117.5	27.2	8.3	1939	61.4	77.1	37.3	14.4
1918	75.7	131.3	24.3	5.7	1940	64.9	78.6	35.6	12.5
1919	70.8	138.6	21.3	6.2	1941	63.0	87.3	36.8	13.6
1920	61.1	154.4	16.4	6.4	1942	63.8	98.8	32.1	11.6
1921	61.2	97.6	29.4	11.4	1943	64.7	103.1	32.8	11.6
1922	61.4	96.7	38.1	14.7	1944	69.8	104.0	29.7	9.0
1923	58.0	100.6	36.2	15.2	1945	67.0	105.8	28.2	9.3
1924	59.2	98.1	36.5	14.9	1946	60.5	121.1	26.3	10.4
1925	64.9	103.5	37.6	13.2	1947	60.8	152.1	20.1	7.9
1926	66.0	100.0	39.3	13.4	1948	58.9	165.1	14.3	5.9
1927	64.4	95.4	38.8	13.8	1949	58.9	155.0	13.8	5.7
1928	65.7	96.7	38.8	13.3	1950	54.5	161.5	13.3	6.1
1929	66.4	95.3	40.1	13.5	1951	55.4	180.4	12.5	5.6
1930	66.8	86.4	44.8	14.8	1952	58.2	175.7	12.8	5.3
1931	66.6	73.0	53.2	17.8	1953	----------	173.3	----------	----------
1932	66.8	64.8	59.1	19.6					

Between 1911 and 1918 the price index went up from 64.9 to 131.3 In other words, the price index almost exactly doubled. During the same 8-year period, the tariff ratio went down from 20.3 to 5.7—this price increase and decline in tariff ratio cannot be attributed to the Underwood Act of 1913.

In contrast, when the price index fell from 154.4 in 1920 to 100.0 in 1926, the tariff ratio went up from 5.7 to 13.4, or almost double. This cannot be attributed to the Emergency Tariff Act of 1921 or to the Fordney-McCumber Act of 1922.

Again, as the price index number went down between 1926 and 1932 from 100.0 to 64.8, the tariff ratio went up from 13.4 in 1926 to 19.8 in 1933, and this likewise had practically no relationship to the Hawley-Smoot Act of 1930. It was a measure of the worldwide economic depression, and was an argument in favor of shifting from the historical method (Art. 1, sec. 8) of trade and tariff legislation which had existed from adoption of the Constitution, July 4, 1789, to adoption of the trade agreements program, June 12, 1934.

Notwithstanding this consistent inverse relationship between wholesale price indexes and tariff ratios, slogans and propaganda were presented to make it appear that in 1930 the Congress had passed the highest tariff act in the history of the world. This campaign resulted in the Trade Agreements Act of June 12, 1934, which is to expire June 12 of this year (1954) unless further extended by Congress.

The actual result was a shift from placing responsibility on Congress, to a system of bilateral and later multilateral General Agreements on Tariffs and Trade (GATT) under the auspices of executive agencies.

HOW HIGH OR LOW ARE TARIFFS IN THE UNITED STATES CONTRASTED WITH RATES IN 40 FOREIGN COUNTRIES? 1937 AND 1951 CONTRASTED

During the period of the worldwide depression (1930–34), notwithstanding the consistent, inverse relationship, above described, between prices and tariff ratios, the public, not only of the United States but of foreign countries, were led to believe that our tariffs were high compared with foreign countries. The proponent of reciprocal trade desired much of flexibility (raising or lowering tariff rates within limits of 50 percent following the provisions of section 336 of the Tariff Acts of 1922 and 1930).

This shift gradually resulted, in 1948, in trade agreement matters being turned over to the United Nations agency known as General Agreement on Trade and Tariffs (GATT). GATT is patterned after the plans for an International Trade Organization (ITO) which had previously been rejected by Congress and withdrawn by the State Department.

From what was said in the preceding section it is obvious that the answer to the question "How high or low are tariffs?" would depend very largely upon "How high or low are prices?" Rates of duty written by Congress on June 17, 1930, averaged 40.1 percent based upon dutiable imports at 1929 prices. But by 1932 they averaged 59.1 percent—an increase of 19 percentage points, or almost 50 percent.

Or, based on all imports, the average increased from 13.5 percent, when based upon 1929 prices, to 19.8 percent when based upon 1933 prices—again an increase of almost 50 percent due chiefly to price changes and only slightly influenced by changes in composition of items imported.

The United States Department of Commerce found that the ratio of duties collected to value of dutiable commodities declined from 59.06 percent in 1932 to 37.80 percent in 1937. During this period very few important concessions were made in trade agreements, but unit values of imports (measured by index numbers) had increased by nearly 50 percent.

1937 was the last year before World War II for which the Department of Commerce Foreign Commerce Yearbook published "import values" and "customs duties collected" for 40 or more leading foreign nations as a basis for comparison with the United States. (See also Tax Research Foundation, Tax Systems, Chicago, 1940.)

A recent study made for this Senate committee disclosed that whereas the ratio of duties collected to value of imports in the United States in 1937 was 15.8 percent, the ratio for 40 leading foreign commercial nations was 18.8 percent.

Since 1937 the ratio of duties collected to value of all imports into the United States has decreased from 15.6 to 5.3 percent in 1951, a decrease of 10.3 percentage points or 66 percent. During the same period the decrease in ratio for the 40 foreign nations combined has been only from 18.8 percent in 1937 to 12.6 in 1951—a decrease of only 33 percent.

"USE OF PROPAGANDA SLOGANS ON HALF-TRUTHS IN THE CAMPAIGN FOR FREE TRADE"

It was testified that the most misleading feature of the campaign for lower tariffs or free trade during the past 20 years has been the introduction of propaganda slogans and half-truths. A well-known writer and contributor to popular magazines during this 20-year period has referred to "the dollar gap hoax" as an outstanding illustration of slogans and half-truths. His discussion of this subject appeared in a relatively recent issue of Human Events.

The regular Quarterly Summary of Foreign Commerce of the United States, issued by the Bureau of the Census, Department of Commerce regularly presents in table I what is called balance of exports over imports. In a recent issue it appeared that during the calendar year 1942 exports exceeded imports by $5 billion. In 1943, exports exceeded imports by $9 billion and in 1944 the excess was $10 billion.

These figures did in fact represent a dollar gap or excess of exports over imports during World War II years 1942, 1943, and 1944. The excess decreased to just under $6 billion in 1945 and under $5 billion in 1946, at the close of World War II.

The excess of exports did not continue to fall with the termination of World War II. On the contrary, however, in 1947 the excess had again been increased to about $9 billion, and to more than $5 billion in each of the following years 1948 and 1949. This was the period when the so-called peace gap appeared, because in fact it represented the beginning of the Marshall plan or ECA program and the export figures did not in fact represent ordinary commercial exports, but in large measure represented Government aid in the form of commodities paid for by the United States Treasury.

The following brief table (exhibit H) presents an analysis of the so-called dollar-gap hoax for the last 2 calendar years (1952 and 1953).

EXHIBIT H.—*The dollar-gap hoax*

	Million dollars	
	1952	1953
(a) United States exports (f. o. b.) (including mutual security military aid), total	$15,191.3	$15,747.0
(b) United States imports, general	10,717.5	10,873.7
(c) Excess of so-called exports over imports, commonly called the dollar gap	4,373.8	4,873.3
(a) Total United States exports, (f. o. b.), including (b)	15,191.3	15,747.0
(b) Department of Defense shipments of grant aid military equipment under mutual security	1,987.9	3,503.6
(c) Net exports (excluding item (b))	13,203.4	12,243.4
(a) United States imports, foreign value	10,717.5	10,873.7
(b) United States imports, c. i. f. value	11,637.0	11,725.7

APPROXIMATE REAL DOLLAR GAP

(a) Commercial exports (f. o. b.) (excluding military)	$13,203.4	$12,243.4
(b) General Imports (c. i. f.), value	11,637.0	11,725.7
(c) Gap to be covered by other foreign military aid programs (outside of mutual security) as well as by travel, foreign investments, etc	1,566.4	517.7

The Census Bureau and other Commerce Department statements have the following comment which is significant:

> Export statistics do not include shipments to the United States Armed Forces abroad for their own use.

It will be noted from (exhibit H) that the so-called dollar gap exceeded $4 billion in 1952 and reached nearly $5 billion in 1953. A study of the subject makes it perfectly clear that a very considerable part of the dollar gap here indicated did not represent either commercial exports or import figures comparable to the export figures.

It is an extraordinary situation when appropriations for national defense, mutual security, and other foreign military facilities and military enterprises are enumerated as ordinary exports, giving the erroneous impression that commercial exports in 1952 and 1953 exceeded $15 billion.

A witness stated that the false picture is presented broadly, for a press release issued within the last few days (FT 900, February 18, 1954) has the following to say:

> Exports of domestic and foreign merchandise during 1953 rose to an all-time high of $15,747.0 million, exceeding the previous 1952 high total of $15,191.3 million.

In a footnote on page 2 of this press release there is the following comment:

> The export statistics include mutual security program military aid, mutual security economic aid, and Department of the Army civilian supply shipments.

The regular Quarterly Bulletin of the Census Bureau then proceeds in table I to report total exports exceeding $15 billion in each of the last 3 years and also to report an excess of exports over imports of more than $4 billion during each year. In fact, the excess (what is commonly referred to as the dollar gap) for 1953 would amount to $4,873.3 million.

When the Department of Defense shipments of grant-aid military equipment under mutual security programs is excluded, the net of so-called commercial exports is reduced to about $12 billion in 1953.

It was testified that the export-import figures bear out the dollar-gap hoax, the import figures are consistently given in terms of foreign values and in 1953 amounted to $10,873.7 million. If imports were reported on a cost, insurance, and freight basis, as is regularly done by the International Monetary Fund, the 1953 imports would have a value of $11,725.7 million. Deducting figure for imports from the reduced figure for commercial exports, the 1953 so-called dollar gap would by only $517.7 million. As a matter of fact, however, if other military aid shipments are excluded, there was actually no dollar gap for the calendar year 1953. Instead of a dollar gap of almost $5 billion in 1953, the official record should show a dollar gap in reverse, or an excess of commercial imports over commercial exports. This item would ordinarily be covered in balance of payments, statements to account for travel, foreign investments, etc.

Apparently the only purpose of publishing such misleading figures to depict a fictitious dollar gap is to make it appear that United States exports exceeded imports by something like $5 billion annually, and therefore that the United States must proceed with programs intended to encourage a larger volume of imports in order to balance international trade. The proposed curative for the fictitious dollar gap is

unilateral reduction of United States tariffs. The United States has not only eliminated most of the customs duties or tariffs as they have been recorded for more than 100 years preceding 1934, but at the present time our tariff rates are lower under reciprocal trade agreements than those of practically all important foreign countries. Foreign countries in these same trade agreements have reduced their tariffs less than one-half as much as tariff concessions granted by us. Meanwhile many of the foreign countries have proceeded to restrict imports into their own countries in every conceivable manner, while stimulating, subsidizing and otherwise pressing for an increase in their volume of exports to the United States rather than to their former markets.

"DOLLAR-GAP HOAX AND TRADE VERSUS AID SLOGAN"

We have already suggested that the "dollar-gap hoax" was in fact built up statistically in order to lay the foundation for the lower-tariff-antitrade barrier-propaganda slogan trade versus aid. This apparently was in the nature of a direct bid in the campaign intended to lead as rapidly as possible to a complete free-trade policy for the United States while permitting foreign countries to retain tariffs and other more onerous trade-control devices.

It was testified to that propagandists have not been slow in developing slogans for the purpose of selling the idea of free trade as though it would accomplish freedom of trade. The basic purpose, however, is to remove barriers to imports into the United States, including further reduction, if not complete elimination, of tariffs or customs duties.

It was alleged very few people if well informed as to the results would advocate complete removal of regulations governing trade with foreign countries, repeal of all tariffs, excise taxes and other methods of providing revenue. Section 8 of article I of the Constitution charges the Congress with the responsibility of providing revenue, providing for the general defense and national security, and with the duty of regulating trade with foreign countries. Proponents of free trade have succeeded in transferring this power to the executive department and now their propagandists have developed misleading slogans demanding reduction or removal of United States tariffs and other import controls to effect as near an approach as possible to the unsound policies of free trade.

Attention is directed to the responsibility of Congress to provide a national currency to serve as a measure of value and a medium of exchange, as specifically provided in section 8 of article I of the Constitution, wherein it is further provided that the Congress shall determine the value of the new national currency and its relationship to foreign currencies and foreign-exchange rates. There is no consideration given to value of foreign currencies or to manipulation of exchange rates under the 1934 (Reciprocal) Trade Agreements Act.

NORMAL TRADE DOES NOT EQUALIZE BETWEEN THIS NATION AND EVERY OTHER NATION

It was further stated that one of the current propaganda slogans proclaiming the merits of two-way trade indicates that the value of trade must be equalized between the United States and each of 100 other countries. This is obviously an impractical and unsound economic policy, since probably no two countries in the world either could

or should attempt a direct balance of trade with each other. Sound foreign trade policy involves multilateral trade in which commodities move in literally all directions.

Each country may of course set a goal of balance between that country and the rest of the world. The multilateral trade system of course requires ultimate universal convertibility under which the currency of each country can be converted to the currencies of all other countries.

CONVERTIBILITY IS AUTOMATICALLY ACHIEVED WHEN THERE IS NO FIXED VALUE FOR ANY NATION'S CURRENCY IN TERMS OF ANY OTHER NATION'S

Another allegation was that the proponents of free trade, however, by failing to make much effort to cure present arbitrary and irregular exchange of currency patterns appear to justify the multiple and varying systems in use, which of themselves constitute almost insurmountable barriers to freedom of trade. Individual countries continue to manipulate currency value and convertibility. Some have 5 or 10 or even more different exchange values, changeable from day to day, to accommodate the granting of exchange permits or licenses on preferred items or to facilitate trade with favored nations. The same mechanics in exchange-rate manipulation is used to exclude or limit undesirable import items or to restrict trade with certain nations.

Stimulating import trade by means of drastic cuts in United States duties had been continually advocated. The increase in dollar value of imports into the United States from $1,433 million in 1933 to $10,817 million in 1951 appears to be a tremendous accomplishment. It largely represents, however, inflationary programs in this and foreign countries. During this same period and particularly since 1945, the end of World War II, price manipulations, import and export licensing, permits, barter arrangements, quotas, and so forth, multiple manipulations in value of currencies and exchange have greatly increased in use in most foreign countries.

A witness claimed further increase in the volume of trade or imports into the United States under such conditions could be disastrous to the domestic economy, for the additional export business hoped for would not likely be realized. Adoption of the practices advocated under the trade-not-aid theory could be most unsound policy and would likely produce results in our domestic economy synonymous with more inflation, more debt, more taxes, and more confusion.

FOREIGN EXPLOITATION OF UNITED STATES MARKETS

International trade history over a long period of years furnishes many illustration of foreign exploitations of the American market and harm to certain segments of the domestic economy of the United States. In testimony attached to this report, illustrations are cited covering the period from prior to the Revolutionary War, down to the very recent years.

Reference is made to determined efforts by several foreign governments and cartels to regulate, control, exploit or even destroy the American markets, through price fixing, manipulation of transportation costs, taxation, embargoes and other means of manipulations.

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To avoid needless repetition we come down to the recent years of 1925–26 just preceding the worldwide depression. The Stevenson plan developed by the United Kingdom, Netherlands, and other colonial powers in Europe, led to an increase in the price of crude rubber from about 25 cents per pound to $1.25 per pound. The American market and thus domestic consumers were literally exploited to the extent of a billion dollars a year through their willingness to take advantage of our dependency.

Another illustration was during the years following World War I, when our closest neighbor and friend, Cuba (or those who controlled the sugar market), pushed the price of sugar up to about 25 cents per pound (raw sugar, f. o. b. Cuba), costing the people of this country another billion dollars a year.

Then, through further manipulations in the world market, the price of sugar was forced down to less than 1 cent per pound in an effort to destroy the American market for the producers of such neighboring friendly areas as Puerto Rico, Hawaii, and the Philippine Islands, as well as the domestic cane and beet sugar producers. By these price manipulations the specific rate of duty was increased from the equivalent of a 10-percent tariff to the equivalent of a 100-percent tariff.

On another occasion, our Western Pacific neighbors in Japan, having a complete monopoly of natural camphor, proceeded to exploit the American market and the people of the United States until, in the Tariff Act of 1930, a method of procedure was worked out which led to extensive production of synthetic camphor in this country.

Our friends, the Japanese, did not hesitate to manipulate the American market to their advantage. Again our dependence permitted the exploitation.

Another interesting recent illustration was the control by foreign governments and cartels of cinchona—the basis for production of quinine. They were willing to exploit us, even though it was an item of tremendous importance in the medical field, until a suitable substitute was found.

One further illustration will suffice at this point. Reference is made to the fact that preceding 1937 the United States depended 100 percent upon China for a hundred million pounds of tung oil annually. China was practially the world's only source of tung oil and the United States was practically the only important world market.

When Japan moved in on China they controlled tung oil shipments and the United States was exploited to the limit during the period 1937–41. Of course, following Pearl Harbor, the United States was practically completely cut off from all foreign sources of tung oil.

One of the arguments made was that the above should be sufficient to illustrate the fact that if the Congress of the United States fails to regulate commerce with foreign countries under article 1, section 8, of the Constitution, and to defend our own market and our own raw material productive capacity, we can depend upon other countries exploiting to the limit, pricewise, even though they pose as our best friends.

COMMODITIES WHICH EUROPEAN COUNTRIES WOULD LIKE TO SHIP TO THE UNITED STATES IN LARGE VOLUME

It was alleged that propaganda has been and is still being carried on by domestic and European groups in their desire to more completely open the American market, by advocating further reduction of tariffs and removing other so-called trade barriers.

In general, the various groups which have carried on educational campaigns (popularly referred to as propaganda) have failed to indicate specifically the lists of commodities which they are anxious to pour into the American market. However, it is strongly suggested that the 50 leading commodities classified as critical and strategic are the imports most desired in their plans (see p. 88, pt. 7). It is possible to get a good idea of their ambitions through examination of certain publications. Inasmuch as several of these reports are in printed form, it will serve merely to list at this point some of the more important of these reports. The following should serve as a guide:

1. Report of the ECA, Commerce Mission, October 1949, "to investigate possibilities of increasing Western Europe's dollar earnings."

This report was compiled by a special Commerce mission under the direction of Mr. Paul G. Hoffman, at that time Administrator of ECA. It should be noted, however, that Mr. Hoffman has during the last 5 years been one of the outstanding leaders in this movement and close adviser to the Administrative Chairman of the recent Commission on Foreign Economic Policy.

2. Report to the President on Foreign Economic Policy, November 10, 1950.

This report is commonly referred to as the Gordon Gray report.

3. Partners in Progress, March 1951, by what has been recorded as the International Development Advisory Board, in response to a letter from the President dated November 24, 1950.

4. A Trade and Tariff Policy in the National Interest, commonly referred to as a report to the President by the Public Advisory Board for Mutual Security.

This report is commonly referred to as the Bell report. It is widely distributed by the Mutual Security Administration at the present time.

5. Report to the President and the Congress, January 1954, by the Committee on Foreign Economic Policy.

In addition to these five reports there have been several elaborate reports compiled and issued by General Agreement on Tariffs and Trade, an agency of the United Nations—to which more detailed reference will hereafter be made. There have also been a series of publications under the general title, "Financial Stability and the Fight Against Inflation," published by Office of European Economic Cooperation. This series of reports, the latest of which reports (the fifth report), has just been issued under date of February 26, 1954.

In addition to general reference to these reports, it seems desirable to put in this summary reference to a tabulation of 63 items or commodities, most of which are largely manufactured in Western European countries which, it is claimed by Office of European Economic Cooperation, are especially adapted for the American market. This list

of 63 items was published under date of December 1953. (See list of 63 important commodities announced by the Office of European Economic Cooperation as particularly adapted to the markets of the United States, reproduced in attached testimony.)

AGENCIES OF THE UNITED STATES GOVERNMENT WHICH HAVE JURISDICTION OVER TARIFFS, REVENUE, FOREIGN TRADE, CURRENCIES, EXCHANGE, TRADE AGREEMENTS, AND TREATIES WHICH INCLUDE THE REGULATION OF COMMERCE WITH FOREIGN NATIONS AND THE EXCHANGE VALUE OF FOREIGN COIN

One of the witnesses pointed out that with adoption of the Constitution there was intended to be a very definite separation of jurisdiction as between the Congress, the judiciary, and the executive.

Tariff acts were within the immediate and exclusive jurisdiction of Congress, subject to veto by the President who in turn was subject to an overriding vote of Congress.

The State Department was to appoint ambassadors, consuls, etc., and to negotiate treaties for the President—all subject to Senate approval. The Custom Bureau fell in the jurisdiction of the Treasury Department.

With expansion and increase in complexities of Government changes have been made and now the following agencies of Government are included in those directly involved in foreign economic policies.

1. Both Houses of Congress must act upon all laws and in addition the Senate must act on selection of ambassadors et al. and on approval of treaties.

2. The President is charged with negotiation of treaties and trade agreements as well as appointment of ambassadors, et al., subject to Senate approval.

3. The consular service is within the jurisdiction of the State Department, as is the actual negotiation and actual supervision of trade agreements.

4. The Customs Bureau is within the jurisdiction of the Treasury Department.

5. National Defense and Public Security come largely under the Department of Defense, subject to the Security Council and the President as Commander in Chief.

6. The Mutual Security Administration (or its successor) is a quasi-independent agency, subject to the President and the State and Defense Departments.

7. Administration of the so-called point 4 program of foreign aid comes within the Mutual Security Administration (or its successor).

8. The Bureau of Foreign Commerce, with its many divisions, is within the Department of Commerce.

9. The Census Bureau is the statistical agency for Treasury, State, Commerce, and other departments and divisions.

10. The United States Tariff Commission is an independent agency of the Congress, in a measure affiliated with State, Treasury, Commerce, and others.

11. The Department of Agriculture maintains a Foreign Agricultural Service divided into a series of special divisions.

12. Various other departments (such as the Department of the Interior) have activities bearing upon foreign economic relations.

13. Miscellaneous agencies to administer special operations.

The above outline as contrasted with organization as formulated by the Constitution, is an oversimplification since many of the present agencies have close association with such international activities as the United Nations and its farflung group of special economic agencies, the International Monetary Fund and World Bank, the Export-Import Bank, and such other financial agencies as the Federal Reserve Board.

CONTROL OVER VOLUME AND VALUES OF INTERNATIONAL TRADE BY GOVERNMENTS OF FOREIGN COUNTRIES

There exists a general impression that, since the passage of the Trade Agreements Act, June 12, 1934, the United States and foreign countries have perfected a workable program of bilateral trade agreements. The principal function of such agreements being to adjust tariff rates (up or down as much as 50 percent, as provided for in sec. 115 of the Tariff Act of 1922 and sec. 336 in the Tariff Act of 1930), and to reduce, remove, or simplify other so-called trade barriers.

One of the allegations made was that most foreign countries with which such negotiations or agreements have been made have by our State Department or through General Agreement on Tariffs and Trade avoided reducing tariffs and simplifying customs procedures, while gaining concessions from the United States. The process has been far from reciprocal.

Probably the greatest barrier to equitable, reciprocal trade between the nations has been the trend toward nationalism and socialism, exemplified by expropriation of private property and business, including private funds, and in many cases the adoption of State trading or barter. The formation of exchange monopolies by foreign governments for manipulation of currency values, the use of quotas, import and export licenses and permits and other exchange control devices were but natural consequences of nationalistic, socialistic trade policies.

These controls (combined with widespread use of cartels) have resulted in stagnation of foreign trade and in inflation and price control within the countries themselves. The combined result has prevented orderly functioning of trade either with or without bilateral trade agreements.

MASTER LIST OF ALL BILATERAL TRADE AGREEMENTS THAT THE UNITED STATES HAS CONCLUDED UNDER THE TRADE AGREEMENTS ACT OF JUNE 12, 1934, AS AMENDED AND EXTENDED, AND THEIR STATUS ON APRIL 1, 1953

Reference was made to a list of bilateral trade agreements entered into under the Trade Agreements Act of June 12, 1934, as amended and extended, the effective date of such agreements, and their most recent status and relationship to GATT. The following tabulation presents such a list showing in each case date terminated, suspended, or superseded or joined as a segment of GATT.

In addition to the 29 countries with which this country completed bilateral trade agreements prior to December 31, 1947, an additional list of 21 (mostly colonies or former parts of empires), have been

invited during 1948, 1949, 1950, and 1951 to subscribe to the general agreement and to become members of GATT.

A. Miscellaneous countries outside of Canada, Latin America, and continental Europe

Country	Date effective	Date terminated, suspended, or superseded	Remarks
Finland, bilateral agreement	Nov. 2, 1936	Terminated May 24, 1950	Acceded to GATT May 25, 1950.
United Kingdom, bilateral agreement.	Jan. 1, 1939	Suspended Jan. 1, 1948	Acceded to GATT Jan. 1, 1948.
Turkey, bilateral agreement	May 3, 1939	Terminated Aug. 4, 1952	Acceded to GATT Oct. 17, 1951.
Iceland, bilateral agreement	Nov. 19, 1943		
Iran, bilateral agreement	June 28, 1944		

(B) Bilateral agreements with Latin American countries

[Arranged in order of 1st agreement preceding GATT]

Country	Date effective	Date terminated, suspended, or superseded	Remarks
Cuba: [1]			
1st bilateral agreement	Sept. 3, 1934	Suspended, Jan. 1, 1948	Acceded to GATT.
1st supplemental bilateral.	Dec. 29, 1939		
2d supplemental bilateral	Jan. 5, 1942		
GATT	Jan. 1, 1948		
Exclusive bilateral, supplementing GATT.	do		
Other Latin American bilateral agreements:			
Haiti	June 3, 1935	Terminated, Dec. 31, 1949	Acceded to GATT, Jan. 1, 1950.
Brazil	Jan. 1, 1936	Suspended, July 30, 1948	Acceded to GATT, July 31, 1948.
Honduras	Mar. 2, 1936		
Columbia	May 20, 1936	Terminated, Dec. 1, 1949	Terminated by joint agreement.
Guatemala	June 15, 1936		
Nicaragua	Oct. 1, 1936	Duty concessions and certain other provisions terminated Mar. 10, 1949. Entire agreement terminated, May 27, 1950.	Terminated by joint agreement. Acceded to GATT, May 28, 1950.
El Salvador	May 31, 1937		
Costa Rica	Aug. 2, 1937	Terminated, June 1, 1951	Terminated by joint agreement.
Ecuador	Oct. 29, 1938		
Venezuela	Dec. 16, 1939		
Supplementary	Oct. 11, 1952		
Argentina	Nov. 15, 1941		
Peru	July 29, 1942	Terminated, Oct. 7, 1951	Acceded to GATT, Oct. 7, 1951.
Uruguay	Jan. 1, 1943		
Mexico	Jan. 30, 1943	Terminated, Dec. 31, 1950	Terminated by joint agreement.
Paraguay	Apr. 9, 1947		

[1] Cuban trade agreement was only truly reciprocal agreement entered into. It was separately authorized in the trade agreements amendment, sec. 350.

(C) Agreements entered into with Canada and European countries

[Arranged in order of 1st agreement preceding GATT]

Country	Date effective	Date terminated, suspended, or superseded	Remarks
Bilateral agreement:			
Belgium	May 1, 1935	Suspended, Jan. 1, 1948	Acceded to GATT, Jan. 1, 1948.
Luxembourg	do	do	Do.
Sweden	Aug. 5, 1935	Terminated, June 30, 1950	Acceded to GATT, Apr. 30, 1950.
Netherlands	Feb. 1, 1936	Suspended, Jan. 1, 1936	Acceded to GATT, Jan. 1, 1948.
Switzerland	Feb. 15, 1936		Modified, 1950.
France	June 15, 1936	Suspended, Jan. 1, 1948	Acceded to GATT, Jan. 1, 1948.
Czechoslovakia	Apr. 16, 1938	Proclamations making effective reduced rates of duty terminated by United States, Apr. 22, 1939.	Occupation of parts of Czechoslovakia by Germany and Hungary made it possible for Czechoslovakia to fulfill its obligations under the agreement.
GATT	Apr. 20, 1948	All obligations under the general agreement suspended by United States, Sept. 29, 1951. Proclamation making reduced rates of duty effective terminated by United States, Nov. 2, 1951.	Suspended pursuant to sec. 5, Trade Agreements Extension Act of 1951.
Canada:			
1st bilateral	Jan. 1, 1936	Superseded, Jan. 1, 1939	Superseded by 2d bilateral agreement.
2d bilateral	Jan. 1, 1939		Acceded to GATT, Jan. 1, 1948.
Supplemental bilateral	Jan. 1, 1940	Suspended, Jan. 1, 1948	
Do	Dec. 20, 1940		
GATT	Jan. 1, 1948		

Following is a brief outline of the extent to which foreign countries, acting under United Nations and GATT auspices, have introduced a multitude of schemes, other than tariffs to control volume and value of import and export trade.

(1) Unilateral control of commercial policies: A careful check of 1 recent month (October 1953) disclosed a total of 17 announced changes in the form of unilateral control of commercial policies. These are listed in testimony presented to this committee, with description of action taken.

(2) Unilateral changes in customs tariffs and charges dealing with imports: In addition to changes in commercial policies a record for the same month discloses 17 cases of unilateral changes in tariffs or other charges affecting imports. Many of these affected exports from the United States. A detailed list was submitted in evidence.

(3) Unilateral changes in customs duties or other charges in the case of exports: Many countries have resorted to tariff and other charges on exports. During the month of October a total of five such cases were reported and the details appear in testimony.

From these 3 lists, during 1 month, there were 38 unilateral policy changes recorded or an average of more than 1 each day, indicating the extent to which foreign countries are breaking away from bilateral trade agreements since the United States has shifted from congressional tariff-making to State Department handling of our foreign trade relations.

(4) Use of quantitative controls over commodity imports: In addition to the 38 unilateral actions bearing upon commercial policies, tariffs and charges on imports and exports, a search of the record for October disclosed a total of 11 countries changing policy in the matter of quantitative controls or quotas of imports.

(5) Use of quantitative controls over commodity exports: The same search of world records for October disclosed a list of six foreign countries changing quantitative controls over exports. A description of these 17 developments covering import and export quantitative controls was introduced into the record.

(6) Foreign government shifting from private trading to State trade: In two countries, Brazil and United Kingdom, by executive action, shifts were made which had an important effect upon our foreign trade, exchange, etc.

(7) Barter and special trade arrangements between pairs of foreign countries, for control over volume and value of international trade: The public has in general been led to believe that the United States, in the form of bilateral trade agreements, has largely completed the job of reducing tariffs and simplifying customs procedures on a reciprocal basis. It was testified development of GATT, trade agreements (by pairs of foreign countries) are rapidly displacing the original bilateral system. A search covering the month of October showed that a total of 38 of the new type of barter arrangements had been entered into between pairs of countries—involving 76 countries—from which the United States was excluded. Details of each of these barter arrangements were introduced in the testimony before this committee.

In the above 7 classifications the records reveal a total of 95 departures in just the month of October 1953, from the legal type of trade agreements under section 350, involving most foreign countries.

One of the witnesses pointed out that this complete breakdown is well advanced. For the year 1951 a count of pairs (without an attempt to digest each agreement) disclosed a total of 159. A detailed check for the last 6 months of 1953 shows a total of 250 pairs culminating in that many barter-type trade agreements between foreign countries.

From the above listing it is apparent that the whole system of tariffs and commercial treaties (and often political treaties) have been affected within the framework of the trade agreements amendment. With the accession of Uruguay December 16, 1953, there are now a total of 34 members in GATT out of a total of about 100 separate national sovereign areas or countries. And there are now a total of 55 member countries associated in the International Monetary Fund dealing with problems of exchange values of currencies, currency manipulations, convertibility, etc.

UNITED STATES CURRENCY AND COINAGE, INTERNATIONAL EXCHANGE AND CONVERTIBILITY VALUE OF FOREIGN CURRENCY, TARIFFS AND PRICES

In addition to the constitutional duties of Congress to provide for customs duties or tariffs and to regulate commerce with foreign nations, section 8 of article I of the Constitution specified that "The Congress shall have power to coin money, regulate the value thereof and of foreign coin."

The Colonies, the temporary government and the newly created Republic of the United States had no regular currency of their own until Congress met following March 4, 1789. Along the St. Lawrence River, French currency prevailed; farther South, British currencies were used down to New York where Dutch money prevailed. Other smaller areas had local or other European currencies, including those

of Sweden. British currencies were in general use south of New York to the border of Spanish possessions where Spanish and Portuguese money prevailed. Exchange among the different currencies was in constant confusion and fluctuations provided opportunity for European colonizing powers to exploit each other and the colonies of America.

Immediately after the first session of the First Congress convened, it was decided to reject all of these foreign currencies, with their varying exchange rates, and values, and to set up a distinctly American system of currencies based upon the United States dollar supported by gold, silver, nickel and copper designated as monetary metals, free from import or export tariffs. Exchange rates with foreign currencies were established as provided in the Constitution. Taxes, debts, foreign trade and all other fiscal, monetary and financial transactions continued to use this system for about 145 years, until 1953 when monetary gold was withdrawn from circulation and fine value of gold was changed from $20.67 to $35 per ounce.

A comprehensive review of the currency and exchange problems of this and foreign countries, with changes in values from year to year, and country to country and of the multiple uses of international exchange, as well as the details of Government manipulations, would require a good-sized volume. While this subject is as important as that of international trade, tariffs, and other matters covered in this summary, space does not permit elucidation of details. It should be noted, however, that cost of production and prices of commodities in this and other countries, under unsound monetary systems, have varied widely. The instability of currencies and recent practices in terms of trade and manipulation of exchange have offered governments tempting opportunities to manipulate to their advantage such factors as tariffs, prices, monetary value, and exchange rates.

A point of great importance is that the recent manipulations in gold value and foreign-exchange ratios really developed during the year preceding passage of the Trade Agreements Act, June 12, 1934. Tariffs, prices, exchange manipulations, foreign trade are all tied into the change from a gold-based currency to "controlled currency," effective January 31, 1934.

The committee has compiled monetary-exchange data for a group of 50 foreign countries beginning with 1937 and including each year since World War II, 1947–52. The 342-page annual report recently issued by the International Monetary Fund gives a great deal of detail on such matters. Testimony and data pertaining to countries, years, multiple-exchange rates, and inconvertibility is included in the committee report.

In the case of France, exchange control was introduced on September 9, 1939. Thereafter, until 1947, there were many annual, monthly, and even daily fluctuations until a new general overhauling and codification of the system was effected in July 1947. Changes in the system of exchange rates on January 26 and October 17, 1948, resulted in the establishment of 2 rates for convertible currencies and 1 rate for other currencies; but on September 20, 1949, a uniform rate system was established. This synchronized with the change in the United Kindgom which at that time completely revised the exchange ratio as between the dollar and the British pound, from $4.03 per pound to $2.80 per pound.

In the case of France, there are two types of exchange rates: (1) "free" market rates for authorized transactions defined in detail. (2) The second type of exchange rate in the case of France is known as the official exchange market rates for currencies dealt in by the Exchange Stabilization Fund. The detailed

difference between the free market rates and official exchange rates is set forth in International Monetary Fund Annual Report, page 153.

The rate for the United States dollar remained between 349.50 francs and 350 francs during 1952. It should be noted, however, that while exchange rates of currencies dealt in on the free market are formed through the interplay of demand and supply mechanism, only those persons who have a general or individual permit from the exchange office can buy exchange through the intermediary of the "free" exchange market and only authorized banks are permitted to operate on the "free" market as intermediaries between the ultimate seller and buyer of specified currencies.

It will be enough in this brief summary to note that the official selling rate, the controlled free rate and the average rate in the case of France, stood at about 30 francs per United States dollar at the end of 1937 before World War II. Because of the fluctuation and exchange manipulations, this had increased to about 120 francs per United States dollar by the end of 1947. By the end of 1948, as a result of changes in the French exchange control system, the official selling rate had reached 214.71 francs per United States dollar, while the controlled free rate had reached 317.60 francs per United States dollar and the average rate was 266.16 francs per United States dollar.

It has already been noted that the British pound sterling conversion from $4.03 per pound to $2.80 per pound took place on September 20, 1949. At that time, separate official selling rate and controlled free rate, as between the French franc and the British pound as well as the United States dollar, terminated, and since that date (September 20, 1949) a uniform general rate has prevailed and (aside from fluctuations), stands at 350 French francs per United States dollar just as the official selling rate as between the dollar and the pound sterling stands at $2.80 a pound, with a range 2 cents above and below that figure to which attention has already been called.

Perhaps it should be noted in passing that reference to the exchange rates for France in the attached table discloses in the case of free rates "francs per equivalent of one United States dollar at official cross rates" ranged at the end of 1952 between 368 francs for British pound sterling notes, to 578 francs per pound for gold sovereigns. These differences, as well as the innumerable fluctuations daily or hourly, have a tremendous bearing upon prices of commodities in the international market, and by a process of manipulation of exchange rates it is possible to practically change tariff rates on commodities as between France and the United States and other countries from day to day or even from hour to hour. This is one of the reasons why it would appear that the time had come to discontinue the trade agreements program which makes a gesture in which rates of duty are specified, but in actual practice it must be evident that rates of duty actually applied not only may be but actually are shifted from month to month and from day to day in the case of literally hundreds of commodities which are imported or exported by France and exported or imported by the United States.

The detailed system of operations in the case of the 50 countries is spelled out in the annual report of the International Monetary Fund which, as already noted, is a volume of 342 pages. It would seem that unless specific illustrations for individual years, individual countries, etc., would be desired, it would be sufficient here merely to refer to the attached table dealing with these 50 countries, and, on the other hand, for monthly fluctuations, to refer to the monthly report of the International Monetary Fund, and for a description of the differences between different countries and different methods of handling exchange, to refer to the annual report of the fund to which reference has already been made.[1]

To illustrate the fluctuations in exchange rates, it is noted here that the traditional value of the French franc was nearly 20 cents or 5 francs per 1 United States dollar. By the end of 1937, before World War II, exchange stood at about 30 francs per United States dollar (or about 3⅓ cents per franc). By the end of 1948, as a result of changes in the French exchange-control system, the official selling rate had reached 214.71 francs per United States dollar, or less than one-third of a cent per franc.

The British pound sterling was devaluated September 20, 1949. Since that date a uniform general rate has prevailed. The franc was further devaluated about the same time. The franc stands at 350

[1] Hearings, pt. 7, pp. 142-143.

per United States dollar and the official selling rate as between the dollar and the British pound stands at $2.80 per pound, with a general range of 2 cents above or below that figure. The official or published foreign exchange rates are not reliable, however.

Exchange is subject to license in most foreign countries and there may be 10 or 20 different rates applied to license for exports, imports or other financial transactions. Then there are free market rates and curb rates. Thus there are hundreds of major or minor fluctuations according to use to be made of the exchange.

It is apparent that the practice of Government exchange monopoly, licenses, multiple exchange rates and consequent nonconvertibility under which it is possible for the Government to manipulate exchange at any time, or any commodity or transaction, depending upon the purpose. In turn, where international trade or tariffs are involved it is possible to raise or lower prices and manipulate tariffs.

Tables of exchange rates from 1937 to 1952, for 50 countries, with detailed explanations and relations to tariffs, prices and other fiscal and financial problems are included in testimony to the committee.

CUSTOMS DUTIES (OR TARIFFS) AND TRADE WITH FOREIGN NATIONS; ADJUSTMENTS IN TARIFF TREATMENT IN TARIFF ACTS BEFORE PASSAGE OF SECTION 350 AS AN AMENDMENT TO THE FINAL TARIFF ACT OF 1930

Section 350 is known as the Trade Agreements Act which became effective June 12, 1934, and therefore will have been in full force and effect for a period of 20 years when it expires under terms of the present extension, on June 12, 1954.

The first act of the first session of the First Congress was a tariff act, under powers granted it in the Constitution, which prescribed customs duties on all imports and which otherwise provided for the regulation of trade with foreign countries. It was approved by President Washington on July 4, 1789. This first act was largely formulated by Alexander Hamilton, first Secretary of the Treasury in the first Washington administration. He was further instructed to make a comprehensive study of the subject and in 1791 presented to President Washington and the Congress a general plan for tariff revision and for the application of customs duties to imports from foreign countries.

From July 4, 1789, until June 17, 1930 (a period of more than 140 years), the Congress carried out the authorization set forth in section 8 of article I of the Constitution and all tariff acts during this period have been acts of Congress subject to Presidential veto. During that period, relatively little use was made of the power of treatymaking which rested with the President, subject to a two-thirds majority of the Senate.

Tariff acts were revenue measures adopted by Congress. At different times, Presidents and Members of Congress discussed the desirability of special bilateral treaties under the general title of treaties of reciprocity. Among early sponsors of this suggestion were such Republican leaders as Congressman Dingley, Congressman (and later President) McKinley and President Taft. But, as already noted, no important change was made during these 140 years in the field of political and commercial treaty-making and tariffs (except the Cuban Treaty) and executive trade agreements involving tariff rates did not

appear among United States foreign economic policies until passage of the Trade Agreements Act of June 12, 1934.

FLEXIBILITY IN TARIFF RATES

In addition to the absolute use of the tariffmaking power, Congress, in the Revenue Act of 1916, created what has become known as the United States Tariff Commission. That agency was created primarily as a Bureau of Information to serve Congress in the drafting of tariff acts. In other words, neither the Tariff Commission nor the President were granted authority to negotiate trade or tariff treaties or agreements with foreign countries. But there was, during that period, a very considerable recognition of the idea that there should be some flexibility in the making of tariffs and in the regulation of foreign trade. The result was that the Tariff Act passed September 21, 1922, known as the Fordney-McCumber Act, carried a series of provisions which introduced flexibility in the making of tariff rates. Tariffs were to be adjusted on an economic basis—fair and reasonable competition.

In 1921, Congress had passed an act dealing with foreign trade, under the general title of Antidumping Act. The administration of that act was placed in the hands of the Secretary of the Treasury. In the Tariff Act of 1922, special provision was made for flexibility in rates and classifications as well as problems of unfair methods of competition in foreign trade and foreign discriminations against United States exports. (See secs. 315–317 of the act of 1922.) In these special sections the Tariff Commission, as an agency of Congress, was given power to go into questions of ratemaking, with definite criteria and within limits, unfair methods of competition and foreign discriminations. While the Tariff Commission was created as an agency of Congress, reports were made directly to the President who was given power to veto or approve findings or recommendations of the Tariff Commission, as if they had come as bills from Congress.

We need not here review in detail the number of investigations carried on by the Tariff Commission during the period September 21 1922, to June 17, 1930, except to say that relatively few rates were reviewed or changed through this process. The Tariff Commission was recognized as an agency of the Congress, but there was preserved the process of submitting the reports to the President and the right was reserved for the President to veto or approve findings of the Commission as the President might approve or veto acts of Congress.

When the Tariff Act of 1930 was finally completed, it contained the same three provisions as were in the Tariff Act of 1922 except that the paragraphs in question were numbered sections 336–337 and 338. However, the same idea of flexibility was incorporated; the Tariff Commission was recognized as an agency of Congress and the President retained veto power.

Relatively few changes in the tariff structure were attempted by the newly appointed Tariff Commission between June 18, 1930, and June 12, 1934, at which time the Trade Agreements Act was passed as an amendment to the Tariff Act of 1930.

CONGRESS CANNOT TRANSFER FUNCTIONS

Dr. John Lee Coulter, tariff consultant, expressed the following views: That while the question of commercial treaties or the introduc-

tion of reciprocity had been under consideration for a period of about 50 years preceding the Trade Agreements Act of 1934, and while the degree of flexibility had been provided in the Tariff Acts of 1922 and 1930, the Nation as a whole through the Congress had never delegated ratemaking powers to executive agencies. It was held that the matter of taxes, including tariffs, was a matter subject to the approval of the people as represented by Congress and that such powers, given in the Constitution, were specifically enumerated and delegated to Congress

It may be well to record the fact that in one important case, where the Tariff Commission recommended a change in the tariff rate (subject to Presidential veto or approval), this action was challenged in the courts and was finally carried to the Supreme Court of the United States.

In that case, the action of Congress in setting up the Tariff Commission as an agency, was sustained, and the entire conduct of the Commission was likewise sustained, the Court holding that this was not a delegation of power to an executive agency and that it was carried out according to the specifications laid down by Congress. It is believed that while other agencies such as the customs court and the Court of Customs and Patent Appeals have since been created to administer specific technical details of tariff acts, the only definite final court decision in the record is that just referred to, wherein the Supreme Court approved the action of Congress and the work of the Tariff Commission.

THE TRADE AGREEMENTS ACT OF JUNE 12, 1934

We come now to passage of an amendment to the Tariff Act of 1930 which became effective as section 350 of that act on June 12, 1934. Thus, it may be said that idea of delegation of tariffmaking powers and regulation of foreign trade, passed from Congress to the Chief Executive with the passage of the Trade Agreements Act as an amendment of the Tariff Act of 1930.

STATE DEPARTMENT ADMINISTRATION

The Trade Agreements Act, as originally passed, specified a period of 3 years during which the President might carry out the duties imposed upon him. Actual administration was placed in the hands of the State Department, which among other matters of foreign policy was responsible for international treaties and commercial agreements. However, appointment of ambassadors, ministers, consular agents, and ratification of negotiated treaties are submitted to the Senate, through the President, for its approval through two-thirds affirmative vote.

THE MOST-FAVORED-NATION CLAUSE

The 1934 Trade Agreements Act contains what has become known as the most-favored-nation clause, meaning that when a trade agreement is made with a foreign nation by this country under that clause every other nation benefits in like manner without making any concessions.

It has always been assumed that just as the President had been granted power to approve or veto acts of Congress and that Congress in turn had the power to override the action of the President, that therefore either the Congress or the Senate, as the case might be,

might override any action of the President in the administration of the Trade Agreements Act.

This interpretation has been in constant controversy since passage of the Trade Agreements Act but so far the subject has never been officially brought before the Supreme Court of the United States for adjudication.

The result is that the Congress and the Tariff Commission have for all practical purposes lost their tariffmaking powers. Such power has been placed in the hands of the Chief Executive (subject to 3-year extensions and the right to cancel agreements in whole or in part) and has been executed by the State Department with no restraining check procedures.

This procedure continued from June 12, 1934, until 1950, when there were included in the Trade Agreements Act provisions commonly referred to as "peril point" and "escape clauses." These provisions were added because it was apparent that the power for tariffmaking and regulation of trade had been improperly transferred exclusively to the President and administered under the direction of the Secretary of State, without even proper opportunity for the Congress to review the actions taken.

During the 80th Congress, a series of provisions for the protection of domestic industry were incorporated in the extension act to the effect that applications by domestic industries for changes in rate of duty, tariff classifications, etc., should be reviewed by the Tariff Commission. When recommendations were made by the Tariff Commission for relief of an industry from tariff found to be too low, it was provided that if the President failed to approve the recommendations made for relief, he must report to the Congress of the United States his reasons for not doing so. It has long been assumed that the Congress could at that point veto the action of the President, but this has never been done in any case thus far. The President has become (through default) the supreme dictator in this field, although it must still be recognized that the Congress might overrule the President under the general provisions of the Constitution.

Provision was made to the effect that action taken by the President rejecting Tariff Commission findings (even under peril-point and escape-clause provisions), should be left in the hands of the Speaker of the House and the Vice President or Presiding Officer of the Senate, a relatively short period of time before the President could issue final proclamations. This provision suggests that even the right to veto by Congress was terminated. It was also provided that whenever the President or State Department began proceedings to negotiate tariff concessions with foreign countries, these particular items would no longer be subject to the investigations of the Tariff Commission under section 336.

At this point it should be noted that very little use was made of the peril-point and escape-clause provisions prior to the end of 1950, although certain cases calling for investigations became subject to this method of procedure. The escape provisions were contained only in a limited number of bilateral agreements and did not have general application to agreements already in effect.

November 10, 1948, an appeal was made for an investigation in the case of the tariff on spring clothespins, an item provided for in paragraph No. 412 in the Tariff Act of 1930. The original rate of duty in

that case was 20 cents per gross and this rate was reduced a full 50 percent to 10 cents per gross. That particular investigation remained on the calendar of the Tariff Commission for a period of more than 1 year, or until December 20, 1949, at which time the Tariff Commission recommended that no change be made in the reduced rate of duty.

January 24, 1950, an investigation was instituted in the case of women's fur felt hats and hat bodies provided for in paragraph 1526 (a) of the Tariff Act of 1930. That case continued before the Tariff Commission for a period of 9 months and the Tariff Commission recommended cancellation of the concessions agreed to by the President in a trade agreement. The matter rested with the President for a period of 1 month, and on October 20, 1950 (just a few days preceding the national elections of November 1950), the President by proclamation approved the recommendations of the Tariff Commission and the concessions which had been granted were withdrawn.

The only other case which went through all of the different stages had to do with hatter's fur. Application was received by the Tariff Commission on June 22, 1950, and that investigation was completed on November 9, 1951, having been under consideration for a period of nearly 18 months. After a delay of more than 2 months, the President issued a proclamation (January 25, 1952) in which concessions made in a trade agreement were withdrawn in certain cases.

Since the end of World War II the whole program of bilateral trade agreements has been drastically revised. Prior to the war the State Department had carried on individual trade agreement negotiations with individual nations. But after the United Nations had been organized, in February 1946, the Economic and Social Council of the United Nations called for a preliminary meeting of 18 countries to prepare for a conference on trade and employment. This meeting was held in London in November 1946. The representatives of the United States State Department presented a suggested charter for an International Trade Organization. After a series of conferences in London and Geneva, a preliminary draft of plans for a worldwide conference was completed. Finally, a conference was held in Havana, Cuba. Representatives of 58 countries attended the conference. Representatives of 54 countries approved this preliminary draft of a charter providing for an International Trade Organization.

The Havana Charter found very slight approval in the United States or in other countries. In fact, the only country which signed the proposed charter was the small independent Republic of Liberia on the west coast of Africa. When the general disapproval was realized, the proposed charter was withdrawn by the State Department from further consideration of the House and Senate and placed in the inactive files.

Out of this proposed charter there finally has evolved what became known as GATT, or the General Agreement on Tariffs and Trade. The Government of the United States has given "conditional" approval to General Agreement on Tariffs and Trade as an instrument formulated under the United Nations. Even General Agreement on Tariffs and Trade has never received the sanction of Congress or of the Senate, as a treaty. It has no other legal status except that it is an agency worked out through conferences between a group of different countries. Its operations have been only of recent significance. It is doubtful whether it has any legal sanction even in the United

States, since it merely has conditional application. On several occasions when the Trade Agreements Act has been extended, the Congress has inserted a provision to the effect that the Congress has neither approved nor disapproved either the general agreement itself or the action of the President in giving superficial or conditional approval to it.

It has already been noted that what has become known as an escape clause was inserted in some of the earlier trade agreements. Special reference is made to the trade agreement between the United States and Mexico effective January 30, 1943, which, by joint agreement, was terminated December 31, 1950.

The so-called escape-clause and peril-point provisions had been incorporated in the General Agreement on Tariffs and Trade, commonly referred to as GATT. This provision, however, was excluded in some of the individual trade agreements (such as one with Switzerland, which long resisted inclusion of that provision in the trade with the United States).

Even though provisions of the so-called escape clause have not been incorporated in General Agreement on Tariffs and Trade, it should be noted that a considerable number of the original bilateral trade agreements are still in existence. Some countries, party to agreements have not joined General Agreement on Tariffs and Trade. Provisions for so-called escape were not included in some of these early agreements. The use of the escape clause is not therefore universally available in concession agreements made by the United States.

OPERATIONS UNDER ESCAPE-CLAUSE PROCEDURE

General operations of the escape-clause procedure became effective in January 1951. It is, therefore, possible to review experience under the escape-clause provisions during the years 1951, 1952, and 1953, and a portion of 1954.

The United States Tariff Commission (September 1953), published a special report under the title, "Effect of Trade Agreements Concessions on United States Tariff Levels Based on Imports in 1952." In table 9, page 19 of that special report, the Commission reported that a count had been made of all commodities imported into the United States which were subject to tariff treatment (other than items on the free list). The Commission reported a total of 3,337 different commodities affected by trade agreements during the period up to January 1, 1953. Of this total, the Commission reported that rates of duty had been reduced in the case of 2,532 commodities, or 76 percent of all commodities listed in the Tariff Act at that time. In the case of another 148 commodities, the present agreement rates had been bound against tariff increases.

Thus, in the case of 80 percent of all commodities subject to duties, rates of duty had been reduced or had been bound against increase. This left a total of only 657 commodities which had not been changed in trade agreements (either bilateral or general) from passage of the Trade Agreements Act, June 12, 1934, to January 1, 1953. Since relatively few changes (either cancellations or new concessions) were made during the year 1953, this represents a relatively complete record of actions taken in the dutiable list of commodities. It has been variously estimated that in addition to commodities subject to tariffs, there are an estimated total of 1,663 commodities enumerated

in the so-called free list. The total number of commodities dealt with in the Tariff Act of 1930 and in the Tariff Act as it exists today, is therefore about 5,000.

It should be noted that the Tariff Commission has published a supplement to the list above referred to under date of July 1, 1953. No attempt has been made to incorporate the items dealt with in that supplement, but the number is apparently relatively limited.

It should also be noted that during the entire period from June 12, 1934, to the present moment, nothing but concessions have been granted. In other words, even though the Trade Agreements Act authorized increases in rates of duty as well as decreases up to, but not exceeding 50 percent in any case, nonetheless, no increases have been recorded, while a total of 2,680 dutiable commodities have either suffered rate reductions or rates in the original act have been bound against increase. In addition, large numbers of items on the free list have been bound against the imposition of tariffs.

Notwithstanding the fact that concessions have been granted in trade agreements in the case of 2,680 commodities, investigations under escape-clause procedure during 1951, 1952, 1953, and 1954, up to January 19, have applied only to 33 commodities. In fact, investigations have applied to fewer than 30 commodities for the reason that there are several cases in which commodities have been subject to investigation in 2 or more proceedings.

Attached is a complete list of applications for relief during the years 1951–53, up to and including January 1954.

From the standpoint of constitutional authority, section 8 of article I of the Constitution clearly gives Congress authority to impose customs duties and to regulate trade with foreign countries and therefore Congress could at any time vote to change any rate of duty or transfer any item to or from the free list (subject of course to Presidential veto).

This power of Congress is of particular importance in view of the recommendations contained in the recent report of the Commission on Foreign Economic Policy transmitted to the President by the special Commission, on January 23, 1954.

That Commission made many recommendations to increase the tariff-controlling power of the executive department.

The Trade Agreements Act will automatically expire on June 12, 1954, unless extended in present or modified form by Congress.

APPLICATIONS FOR RELIEF UNDER ESCAPE CLAUSE PROCEDURE

(*a*) The President returned the report to the Tariff Commission with request for more data in two cases;

(*b*) In two additional cases, applications for relief were withdrawn at the suggestion of the Commission:

(*c*) The President rejected the Tariff Commission recommendations in three additional cases;

(*d*) The Commission reported in 17 cases to the effect that no injury or threat of injury could be found;

(*e*) In the remaining cases, the latest report is that these are still in process of investigation. In other words, proceedings are pending at the present time. It may be noted that hearings are in progress in the case of watch movements and parts (item No. 26), at the time this memorandum is being dictated.

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PART I—INVESTIGATIONS UNDER ESCAPE-CLAUSE PROCEDURE

Commodity and tariff paragraph	Name and address of applicant	Date application received	Status	Number of producers joining application	Number of concerns from whom information obtained			Number of appearances at hearings	
					Producers	Importers	Other (wholesalers, jobbers, retailers, etc.)	Supporting application	Other
Spring clothespins (par. 412), (1st investigation).	The Demeritt Co., Waterbury, Vt., (6 other producers).	Nov. 10, 1948	Investigation completed, Dec. 20, 1949. No modification in concession recommended.	7	8	25	6	8	2
Women's fur felt hats and hat bodies (par. 1526 (a)).	The Hat Institute, Inc., United Hatters, Cap and Millinery Workers International Union, New York, N. Y.	Jan. 24, 1950	Investigation completed, Sept. 25, 1950. Certain of the concessions withdrawn by Presidential proclamation of Oct. 30, 1950.	17	20	8	6	13	2
Hatters' fur, or furs not on the skin, prepared for hatters' use, including fur skins carroted (par. 1520).	The Hatters' Fur Cutters Association of the U. S. A., New York, N. Y.	June 22, 1950	Investigation completed Nov. 9, 1951. Certain concessions withdrawn by Presidential proclamation of Jan. 5, 1952.	9	20	3	4	8	----------
Jewel-watch and watch movements containing 7 jewels or more but not more than 17 jewels and parts therefor (par. 367) (1st investigation).	Elgin National Watch Co., Elgin, Ill. Hamilton Watch Co., Lancaster, Pa.	Feb. 13, 1951	Report to the President, June 14, 1952. Recommendations of the Commission rejected by the President, Aug. 14, 1952.	3	18	91	14	20	19
Motorcycles (inventories extended to include parts) (par. 369 (b) and (c)).	Harley-Davidson Motor Co., Milwaukee, Wis.	May 21, 1951	Investigation completed June 16, 1952. No modification in concession recommended.	1	5	10	4	20	13
Blue-mold cheese (par. 710)----	National Cheese Institute, Inc., Chicago, Ill.	June 11, 1951	Investigation completed June 12, 1952. No modification in concession recommended.	12	12	11	9	6	1
Screws commonly called wood screws, of iron or steel, (par. 338) (1st investigation).	United States Wood Screw Service Bureau, New York, N. Y.	Aug. 15, 1951	Investigation completed Dec. 29, 1951. No modification in concession recommended.	19	7	6	4	(1)	(1)
Spring clothespins, (par. 412) (2d investigation).	Clothespin Manufacturers of America, Washington, D. C.	Aug. 22, 1951	Investigation completed Aug. 21, 1952. No modification in concession recommended.	7	8	25	8	5	1
Groundfish fillets (par. 717 (b)) (1st investigation).	Massachusetts Fisheries Association, Inc., Boston, Mass. and others.	Sept. 10, 1951	Investigation completed Sept. 4, 1952. No modification in concession recommended.	10	20	18	13	12	9
Garlic (par. 770)----------	Robert S. Stapleton, Gilroy, Calif.	Oct. 8, 1951	Report to President dated June 6, 1952. Recommendations of the Commission rejected by the President, July 21, 1952.	1	(2)	4	----------	17	2

Commission rejected by the President, July 21, 1952.									
Bicycles and parts (par. 371)	Bicycle Manufacturers Association of America, New York, N. Y. Cycle Parts and Accessories Manufacturers Association, New York, N. Y.	Oct. 11, 1951	Investigation completed Oct. 9, 1952. No modification in concession recommended.	54	19	14	7	23	5
Cherries candied, crystallized or glace (par. 737 (4)).	Maraschino Cherry & Glace Fruit Association, New York, N. Y.	Oct. 26, 1951	Investigation completed Oct. 17, 1952. No modification in concession recommended.	12	24	6	10	13	----------
Bonito, canned in oil (par. 718 (a)) (tuna and bonito, canned, not in oil (par. 718 (b)).	California Fish Canners Association, Inc., Terminal Island, Calif.	Nov. 28, 1951							
Do	Columbia River Salmon & Tuna Packers Association, Astoria, Oreg.	Dec. 12, 1951							
Do	Pacific Coast Fish Producers Institute, Westport, Wash.	Dec. 19, 1951	Investigation completed Nov 26, 1952. No modification in concession recommended.	[4] 20	16	15	7	36	7
Do	American Tunaboat Association.								
Do	Lower California Fishermen's Association, San Diego, Calif.	Dec. 20, 1951							
Do	International Association of Machinists, Lodge 389, San Diego, Calif.	Jan. 4, 1952							
Tobacco pipes and tobacco, pipe bowls of wood or root (par. 1552).	American Smoking Pipe Manufacturers Association, New York, N. Y.	Dec. 29, 1951	Report sent to President Dec. 22, 1952. On Feb. 18, 1953, the President requested supplemental information. Supplemental information sent to President Aug. 19, 1953. Recommendations of Commission rejected by President Nov. 10, 1953.	26	27	10	12	5	5
Specified household china tableware, kitchenware, and table and kitchen utensils (par. 212).	Vitrified China Association, Inc., Washington, D. C. National Brotherhood of Operative Potters, East Liverpool, Ohio.	Feb. 11, 1952	Investigation completed Feb. 6, 1953. No modification in concession recommended.	20	10	23	9	6	11
Dried figs (par. 740)	California Fig Institute, Fresno, Calif.	Mar. 17, 1952	Investigation completed. Concession modified by Presidential proclamation of Aug. 16, 1952.[4]	2,000	40	10	33	9	6
Screws, commonly called wood screws, of iron or steel (par. 338), (2d investigation).	United States Wood Screw Service Bureau, New York, N. Y.	Apr. 1, 1952	Investigation completed Mar. 27, 1953. No modification in concession recommended.	19	12	13	3	8	4
Pregnant mares' urine, and estrogenic substances obtained or derived therefrom (par. 34 or 1669).	National P. M. U. Producers Association, Farmer City, Ill.	Apr. 8, 1952	Investigation completed Apr. 2, 1953. No modification in concession recommended.	90	17	11	----------	2	6

See footnotes at end of table, p. 359.

PART I—INVESTIGATIONS UNDER ESCAPE-CLAUSE PROCEDURE—Continued

Commodity and tariff paragraph	Name and address of applicant	Date application received	Status	Number of producers joining application	Number of concerns from whom information obtained			Number of appearances at hearings	
					Producers	Importers	Other (wholesalers, jobbers, retailers, etc.)	Supporting application	Other
Whiting, chalk or whiting or paris white, dry, ground, or bolted (par. 20).	Southwark Manufacturing Co., Camden, N. J.	Apr. 10, 1952	Investigation completed Apr. 9, 1953. No modification in concession recommended.	1	10	4	15	1	4
Wood-wind musical instruments and parts (par. 1541 (a)).	Penzel, Mueller & Co., Inc., Long Island City, N. Y. (4 other producers).	Apr. 29, 1952	Investigation completed Apr. 28, 1953. No modification in concession recommended.	5	32	80	----------	12	8
Cords and twines, tarred or untarred, single or plied, wholly or in chief value of manila (abaca), sisal, henequen, or other hard fiber (par. 1005 (b)).	Cordage Institute, New York, N. Y., and others.	July 7, 1952	Application withdrawn. Investigation discontinued and hearing canceled Jan. 14, 1953.	19	4	6	----------	(1)	(1)
Cotton carding machinery and parts (par. 372).	American Textile Machinery Association, Whitinsville, Mass.	Aug. 12, 1952	Investigation completed July 29, 1953. No modification in concession recommended.	52	2	2	----------	6	2
Screen-printed silk scarves (par. 1210).	Association of Textile Screen Makers, Printers, and Processors, Inc., New York, N. Y.	Apr. 14, 1952	Report sent to President Apr. 13, 1953. On June 10, 1953, the President requested further study.	30	35	7	61	13	7
Rosaries, chaplets, and similar articles of religious devotion made in whole or in part of gold, silver, platinum, gold plate, silver plate, or precious or imitation precious stones (par. 1544).	G. Klein & Son, New York, N. Y. H. M. H. Co., Inc., Pawtucket, R. I.	Sept. 15, 1952	Investigation completed Aug. 21, 1953. No modification in concession recommended.	2	23	22	6	2	2
Watch bracelets and parts thereof of metal other than gold or platinum (par. 1527 (c) (2)).	Watch Attachment Manufacturers Association, New York, N. Y.	Sept. 24, 1952	Investigation completed Aug. 20, 1953. No modification in concession recommended.	29	45	5	----------	----------	6
Hand-blown glassware (par. 218 (f)).	Hand Division, American Glassware Association, New York, N. Y.[4]	Sept. 25, 1952	Report to the President Sept. 22, 1953. President in letter of Nov. 19, 1953, asked for additional information.	4	45	38	15	----------	9
Mustard seeds (par. 781)-------	Montana State Farm Bureau, Bozeman, Mont.	Feb. 9, 1953	Investigation completed Dec. 10, 1953. No modification in concession recommended.	2	8	1	3	2	3

Dried figs (par. 740) (par. 2, Executive Order 10401).	By request of President	Mar. 9, 1953	Review investigation completed June 3, 1953. No modification in rate proclaimed Aug. 16, 1952.	(5)	(5)	(5)	(5)	(5)	(5)		
Manicure and pedicure nippers, and parts (par. 354). Scissors and shears, and blades therefor (par. 357).	Shears, Scissors & Manicure Instruments Manufacturers Association, Newark, N. J.	Mar. 19, 1953	Investigation instituted Mar. 26, 1953. Hearing June 29, 1953. Recommendations of the Commission rejected by the President May 11, 1954.	20	26	78	4	2	1		
Groundfish fillets (par. 717 (b)) (2d investigation).	Massachusetts Fisheries Association, Boston, Mass., and others.	May 27, 1953	Investigation instituted June 16, 1953. Hearing Oct. 20-26, 1953.	8	63	5	12	22	9		
Watch movements and parts (pars. 367 (a) and (c)) (2d investigation).	Elgin National Watch Co., Elgin, Ill. Hamilton Watch Co., Lancaster, Pa. Waltham Watch Co., Waltham, Mass.	Sept. 1, 1953	Investigation instituted Sept. 9, 1953. Hearing Feb. 9, 1954.	7	13	22	12	18	7		
Lead and zinc (pars. 72, 77, 391, 392, 393, and 394).	National Lead and Zinc Committee, Salt Lake City, Utah.	Sept. 14, 1953	Investigation instituted Sept. 16, 1953. Hearings Nov. 3 (lead) and Nov. 5 (zinc).	175	311	24	14	16	5		
Straight (dressmakers' or common) pins (par. 350).	Vail Manufacturing Co., Chicago, Ill., and others.	Sept. 23, 1953	Investigation instituted Sept. 24, 1953. Hearing Mar. 24, 1954.	8	8	17	----------	9	2		
Safety pins (par. 350)	DeLong Hook & Eye Co., Philadelphia, Pa., and others.	Sept. 28, 1953	Investigation instituted Oct. 29, 1953. Hearing Mar. 23, 1954.	4	5	20	----------	10	4		
Fluorspar, acid grade (par. 207).	Ozark-Mahoning Co., Tulsa, Okla., and others.	Oct. 20, 1953	Investigation instituted Oct. 29, 1953. Investigation discontinued and dismissed Nov. 23, 1953, by Commission at applicants' request.	5	2	2	----------	(1)	(1)		
Alsike clover seed (par. 763)	W. W. Thompson, Klamath Falls, Oreg., and others.	Nov. 23, 1953	Investigation instituted Dec. 2, 1953. Hearing Feb. 16, 1954.	3	(7)	----------	----------	7	2		
Spring clothespins (par. 412) (3d investigation).	Clothespin Manufacturers of America, Washington, D.C.	Jan. 7, 1954	Investigation instituted Jan. 25, 1954. Hearing Apr. 20, 1954.	7	9	26	5	16	1		
Ground chicory (par. 776)	E. B. Muller & Co., Port Huron, Mich., and others.	Jan. 19, 1954	Investigation instituted Jan. 25, 1954. Hearing Apr. 27, 1954.	3	3	3	12	6	4		
Screws, commonly called wood screws, of iron or steel (par. 338) (3d investigation).	United States Wood Screw Service Bureau, New York, N. Y.	Jan. 29, 1954	Investigation instituted Feb. 25, 1954. Hearing May 26, 1954.	19	(8)	(8)	(8)	13	4		
Wool gloves and mittens and wool glove linings (pars. 1114 (b), (d), and 1529 (a)).	American Knit Handwear Association, Inc., Gloversville, N. Y.	Mar. 29, 1954	Investigation instituted Apr. 12, 1954. Hearing Sept. 14, 1954.	21	[9] 21	[9] 2	(8)	(8)	(8)		
Glue of animal origin, not specifically provided for and gelatin, not specifically provided for, valued under 40 cents per pound (par. 41).	National Association of Glue Manufacturers, Inc., New York, N. Y.	Apr. 9, 1954	Investigation instituted May 5, 1954.	16	[9] 13	[9] 7	----------	(8)	(8)		

See footnotes at end of table, p. 359.

PART II—APPLICATIONS UNDER ESCAPE-CLAUSE PROCEDURE FOR WHICH NO INVESTIGATIONS WERE INSTITUTED

Commodity and tariff paragraph	Name and address of applicant	Date application received	Status	Number of producers joining application	Number of concerns from whom information obtained			Number of appearances at hearings	
					Producers	Importers	Other (wholesalers, jobbers, retailers, etc.)	Supporting application	Other KK
Marrons	G. B. Raffetto, Inc., New York, N. Y.	Apr. 20, 1948	Dismissed after preliminary inquiry, Aug. 27, 1948.	1	1	1	2	(1)	(1)
Whiskies and spirits	United States Distillers Tariff Committee, Washington, D. C. (application filed on behalf of 28 distilling companies).	Sept. 7, 1948	Dismissed after preliminary inquiry, Jan. 3, 1949.	28	(10)	----------	----------	(1)	(1)
Knitted berets, wholly of wool (1st application).	The American Basque Berets, Inc., New York, N. Y.	Feb. 11, 1949	Dismissed after preliminary inquiry, July 8, 1949.	1	6	4	7	(1)	(1)
Crude petroleum and petroleum products.	Independent Petroleum Association of America, Washington, D. C.	Feb. 15, 1949	Dismissed after preliminary inquiry, May 3, 1949.	(11)	(12)	----------	----------	(1)	(1)
Hops	United States Hop Growers Association, San Francisco, Calif.	Mar. 28, 1949	Dismissed after preliminary inquiry. May 11, 1949.	(13)	----------	----------	----------	(1)	(1)
Reeds, wrought or manufactured from rattan or reeds, cane wrought or manufactured from rattan, cane webbing, and split or partially manufactured rattan, not specifically provided for.	American Rattan & Reed Manufacturing Co., Brooklyn, N. Y.	May 20, 1949	Dismissed after preliminary inquiry, Feb. 17, 1950.	1	—2	—3	----------	(1)	(1)
Narcissus bulbs	Northwest Bulb Growers Association, Sumner, Wash.	June 9, 1949	Dismissed after preliminary inquiry, Jan. 13, 1950.	(14)	----------	----------	----------	(1)	(1)
Sponges, not specifically provided for.	Sponge Industry Welfare Committee, Chamber of Commerce, Board of City Commissioners, Greek Community, all of Tarpon Springs, Fla.	June 14, 1949	Dismissed after preliminary inquiry, July 22, 1949.	4	7	5	4	(1)	(1)
Knit gloves and knit mittens finished or unfinished, wholly or in chief value of wool.	Association of Knitted Glove and Mitten Manufacturers, Golversville, N. Y.	Aug. 5, 1949	Application withdrawn; withdrawal accepted without prejudice by the Commission July 11, 1951.	21	17	8	30	(1)	(1)
Gloves and mittens embroidered in any manner, wholly or in chief value of wool.	(Name changed to American Knit Handwear Association, Inc.)								

Gloves or mittens, knit or crocheted, finished or unfinished, wholly or in chief value of cotton.									
Knitted berets, wholly of wool (2d application).	The American Basque Berets, Inc., New York, N. Y.	Nov. 23, 1949	Dismissed after preliminary inquiry, Jan. 13, 1950.	1	----------	----------	----------	(1)	(1)
Woven fabrics in the piece, wholly of silk, bleached, printed, dyed, or colored, and valued at more than $5.50 per pound.	Textile section of the manufacturers division of the Greater Paterson Chamber of Commerce, Paterson, N. J.	Jan. 5, 1950	Dismissed after preliminary inquiry, Sept. 21, 1950.	3	33	----------	----------	(1)	(1)
Stencil silk, dyed or colored	Albert Godde Bedin, Inc., New York, N. Y.	Jan. 30, 1950	Dismissed after preliminary inquiry, June 7, 1951.	1	1	1	----------	(1)	(1)
Beef and veal; fresh, chilled, or frozen.	Western States Meat Packers Association, San Francisco, Calif., and Washington, D. C.	Mar. 16, 1950	Dismissed after preliminary inquiry, June 30, 1950.	(16)	(16)	----------	----------	(1)	(1)
Aluminum and alloys in crude form (except scrap).	Reynolds Metals Co., Louisville, Ky.	Mar. 24, 1950							
Aluminum in coils, plates, bars, rods, etc.	----------	----------	Dismissed after preliminary inquiry, Nov. 21, 1950.	3	3	1	1	(1)	(1)
Aluminum and alloys in crude form (except scrap).	Kaiser Aluminum & Chemical Corp., Washington, D. C.	Apr. 7, 1950							
Aluminum in coils, plates, bars, rods, etc.									
Lead-bearing materials, lead and lead scrap.	Emergency Lead Committee, New York, N. Y.	May 11, 1950							
Do	New Mexico Miners & Prospectors Association on behalf of lead producers of New Mexico, Albuquerque, N. Mex.	May 16, 1950	Dismissed after preliminary inquiry, Jan. 25, 1951.	(17)	22	----------	----------	(1)	(1)

[1] No hearing held.
[2] Information obtained from the Bureau of the Census on 206 producers.
[3] About 2,500 boatowners and fishermen supported the application of the producers (canners).
[4] Review investigation instituted under Executive Order 10401.
[5] Application withdrawn Feb. 25, 1953, but investigation was continued by the Commission.
[6] Review investigation under Executive Order 10,401 (see dried figs on p. 4 above).
[7] Information obtained from Bureau of the Census on 282 producers.
[8] Investigation in progress.
[9] Hearing not yet held.
[10] Obtained information from United States Distillers Tariff Committee representing 28 producers.
[11] Application filed by Independent Petroleum Association representing about 4,500 members.
[12] Obtained information from Independent Petroleum Association which had about 4,500 members.
[13] Application filed by United States Hop Growers Association representing several hundred hop growers.
[14] Application filed by Northwest Bulb Growers Association, representing several hundred bulb growers.
[15] Application filed by Western States Meat Packers Association representing 240 cattle producers and processors.
[16] Obtained information from Western States Meat Packers Association which represented producers in the Northwest States.
[17] Application filed by Emergency Lead Committee and New Mexico Miners and Prospectors Association representing 175 members.

NOTE.—Statements made to the Committee:

Henry B. du Pont in speaking on the subject of tariffs declares that—

Our industrial strength must be sufficiently robust to meet the challenge of any enemy. Unless it is, we may reach that sorry day when there are no ramparts left to watch and none of us on hand to watch them. I am a poor hand at slogans, but, if we are going to have one, I would like to have something else to put alongside of "Trade—Not Aid." Perhaps "Liberty—Not Slavery," or "Hope—Not Despair," or, most of all, "Life—Not Death."

No American manufacturer can contend that the tariff should be employed to protect inefficiency or disproportionate prices. It is only on those products where wage rates are a major factor in the cost or where the material has a strategic importance that some degree of protection is necessary.

National security must not be auctioned to the lowest bidder. There are no bargains in the safeguarding of our freedom. I have no quarrel with the objective of helping our allies in any way consistent with our own interests. * * * But to deplete our own resources and weaken our own defenses is no answer, either to our allies or ourselves.

W have created an industry in this country that is a most essential element in the national security. And I doubt if we would have it today, if, in the early twenties, we had succumbed to the theory that a slightly lower price, based on much lower wage rates, should prevail without regard to national needs.

The big issue, it seems to me, is not one of tariffs, high, medium, or low, but of what this country must do to insure its security and prosperity in a troubled world. Conceding that we have a stake in the prosperity of other nations, other nations have an even stronger need for our prosperity here * * * We are a good customer only when our consumer purchasing power is high.

Nothing must be allowed to handicap or impede the development of those industries which are essential to the national security and the national defense.

It should be perfectly clear to everyone in Europe, as it should be to everyone here, that anything that weakens the United States threatens the security of all the free world.

APPENDIXES

APPENDIX I

GOVERNMENT AGENCIES, ABBREVIATIONS

ACC—Air Coordinating Committee
ACGO—Advisory Committee on Government Organization
ACMI—Advisory Committee on Management Improvement
ACPA—Advisory Committee on Priorities Administration
ACVFA—Advisory Committee on Voluntary Foreign Aid
AEC—Atomic Energy Commission
AFPC—Armed Forces Policy Council
ARA—Agricultural Research Administration
ARC—American Red Cross
BAE—Bureau of Agricultural Economics
BEC—Bureau of Employees' Compensation
BFDC—Bureau of Foreign and Domestic Commerce
BLS—Bureau of Labor Statistics
BPR—Bureau of Public Roads
CAA—Civil Aeronautics Administration or Civil Aeronautics Authority
CAB—Civil Aeronautics Board
CAP—Civil Air Patrol
CCC—Commodity Credit Corporation
CCS—Combined Chiefs of Staff
CEA—Council of Economic Advisers or Commodity Exchange Authority
CETOAS—Committee on Equity of Treatment and Opportunity in the Armed Forces
CIA—Central Intelligence Agency
CND—Council of National Defense
DATA—Defense Air Transportation Administration
DEPA—Defense Electric Power Administration
DFA—Defense Fisheries Administration
DMA—Defense Manpower Administration
DMB—Defense Mobilization Board
DMEA—Defense Minerals Exploration Agency
DMPA—Defense Materials Procurement Agency
DPA—Defense Production Administration
DPC—Displaced Persons Commission
DSFA—Defense Solid Fuels Administration
DSMA—Defense Supply Management Agency
DTA—Defense Transport Administration
EIBW—Export-Import Bank of Washington
FBI—Federal Bureau of Investigation
FCA—Farm Credit Administration
FCC—Federal Communications Commission
FCDA—Federal Civil Defense Administration
FCIC—Federal Crop Insurance Corporation
FCMSBR—Federal Coal Mine Safety Board of Review
FCU—Federal Credit Unions
FDA—Food and Drug Administration
FDIC—Federal Deposit Insurance Corporation
FEB—Fair Employment Board
FFC—Foreign Funds Control in Treasury Department
FFCB—Federal Farm Credit Board
FHA—Federal Housing Administration or Farmers Home Administration
FMB—Federal Maritime Board
FMCS—Federal Mediation and Conciliation Service
FNMA—Federal National Mortgage Association
FOA—Foreign Operations Administration
FPC—Federal Power Commission

FSC—Federal Safety Council
FTC—Federal Trade Commission
GAO—General Accounting Office
GCC—Government Contract Committee
GPB—Government Patents Board
GPO—Government Printing Office
GSA—General Services Administration
HHFA—Housing and Home Finance Agency
HLBB—Home Loan Bank Board
IADB—Inter-American Defense Board
ICC—Interstate Commerce Commission or Indian Claims Commission
ICSRD—Interdepartmental Committee on Scientific Research and Development
IDAB—International Development Advisory Board
IEFC—International Emergency Food Council
MA—Maritime Administration
MB—Munitions Board
NAAC—National Agricultural Advisory Commission
NABMP—National Advisory Board on Mobilization Policy
NACA—National Advisory Committee for Aeronautics
NACMP—National Advisory Committee on Mobilization Policy
NEC—National Enforcement Commission
NLRB—National Labor Relations Board
NPA—National Production Authority
NSA—National Shipping Authority
NSC—National Security Council
NSF—National Science Foundation
NSRB—National Security Resources Board
NSTC—National Security Training Commission
OCB—Operations Coordinating Board
OCS—Office of Contract Settlement
ODM—Office of Defense Mobilization
OEM—Office for Emergency Management
OIT—Office of International Trade
OSSR—Office of Selective Service Records
PAD—Petroleum Administration for Defense
PAPA—Philippine Alien Property Administration
PBS—Public Buildings Service
PHA—Public Housing Administration
PHS—Public Health Service
PMA—Production and Marketing Administration
PWDC—Philippine War Damage Commission
RAWB—Railroad and Airline Wage Board
RB—Renegotiation Board
RDB—Research and Development Board
REA—Rural Electrification Administration
RFC—Reconstruction Finance Corporation
RPFDC—Rubber Producing Facilities Disposal Commission
RRB—Railroad Retirement Board
SCS—Soil Conservation Service
SDPA—Small Defense Plants Administration
SEC—Securities and Exchange Commission
SPARS—Women's Coast Guard Reserves
SSS—Selective Service System
TC—The Tax Court of the United States
TVA—Tennessee Valley Authority
USCG—United States Coast Guard
USDA—United States Department of Agriculture
USECA—United States Emergency Court of Appeals
USES—United States Employment Service
USIA—United States Information Agency
USMC—United States Marine Corps
USSBD—United States Savings Bonds Division
VA—Veterans' Administration
WAC—Women's Army Corps
WAVES—Women Accepted for Volunteer Emergency Service (Women's Reserve, United States Naval Reserve)
WC—War Council
WCC—War Claims Commission

APPENDIX II

[S. Res. 143, 83d Cong., 1st Sess.

RESOLUTION

Resolved, That the Senate Committee on Interior and Insular Affairs, or any duly authorized subcommittee thereof, is authorized and directed (1) to make a full and complete investigation and study of the accessibility of critical raw materials to the United States during a time of war; (2) to study and recommend methods of encouraging developments to assure the availability of supplies of such critical raw materials adequate for the expanding economy and the security of the United States; and (3) to report to the Senate at the earliest possible date, not later than January 31, 1954, the results of its investigation and study, together with its recommendations.

SEC. 2. For the purposes of this resolution, the committee, or any duly authorized subcommittee thereof, is authorized to employ upon a temporary basis such technical, clerical, and other assistants as it deems advisable, and is authorized, with the consent of the head of the departments or agency concerned, to utilize the reimbursable services, information, facilities, and personnel of any of the departments or agencies of the Government, or of qualified private organizations and individuals. The expenses of the committee under this resolution, which shall not exceed $37,500, shall be paid from the contingent fund of the Senate uopn vouchers approved by the chairman of the committee.

APPENDIX III

WITNESSES WHO APPEARED BEFORE THE SUBCOMMITTEE

Albright, Horace, United States Potash Co., New York., part 10.
Anderson, Robert B., Secretary of the Navy, Washington, D. C., executive session (strategic political problems affecting accessibility of strategic and critical materials).
Armstrong, Willis, Office of International Materials Policy, Economic Affairs Division, State Department, Washington, D. C., part 4.
Arn, Hon. Edward F., Governor of Kansas, Topeka, Kans., part 6.
Atwood, J. Lee, president, North American Aviation Corp., Inglewood, Calif., part 3.
Badger, W. L., manager, small aircraft engine laboratory, General Electric Co., Lynn, Mass., part 9.
Batcheller, Willis T., consulting engineer, Arctic Building, Seattle, Wash., part 10.
Benson, Hon. Ezra T., Secretary of Agriculture, Washington, D. C., part 9.
Bishop, Hon. C. W., Member of Congress, Illinois, part 10.
Bittner, L. H., vice president and director of purchases, Allegheny Ludlum Steel Co., Pittsburgh, Pa., part 9.
Blue, Delwin D., Assistant Chief, Light Metals Branch, Bureau of Mines, Washington, D. C., parts 1 and 9.
Bolte, Frank B., Northrop Aircraft, Hawthorn, Calif., part 3.
Boyle, Clyde, Sodac Mining Co., Edgemont, S. Dak., part 9.
Bradford, C. I., vice president, Remcru Titanium, Inc., Midland, Pa., part 3.
Bradley, James P., Bradley Mining Co., San Francisco, Calif., part 10.
Bradley, P. R., Jr., consulting engineer, San Francisco, Calif., part 10.
Brewster, Burt B., Salt Lake City Mining Review, Salt Lake City, Utah, part 9.
Bristol, Fay I., Oregon Mining Association, Grants Pass, Oreg., part 10.
Brown, Russell B., Independent Petroleum Association of America, Washington, D. C., part 6.
Brussolo, V. A., mining engineer, General Services Administration, Washington, D. C., part 9.
Buehler, J. H., Colorado River Commission, Pioche, Nev., part 3.
Burks, Dr. H. C., Jr., Esso Standard Oil Co., New York, N. Y., part 6.
Burns, K. J., Director, Iron and Steel Division, Department of Commerce, Washington, D. C., part 10.
Burrill, Cecil, Director and vice president, Creole Petroleum Corp., New York, N. Y., part 6.
Cahlan, A. E., Colorado River Commission, Las Vegas, Nev., part 3.

Callaghan, Eugene, Bureau of Mines, Mineral Resources, Santa Fe, N. Mex., part 9.
Cameron, Frank, St. Joseph Lead Co., New York, N. Y., part 10.
Carney, Adm. Robert B., Chief of Naval Operations, Washington, D. C. (strategic political problems affecting accessibility of strategic and critical materials) (executive session)
Cattell, R. A., Chief, Petroleum and Natural Gas Branch, Bureau of Mines, Washington, D. C., part 6.
Cheney, Stanley, vice president, Plymouth Cordage Co., c/o Cordage Institute, 1028 Connecticut Ave., N. W., Washington, D. C., part 10.
Coleman, J. P., Wichita Falls, Tex., part 6.
Cook, Richard, Director of Production, Atomic Energy Commission, Washington, D. C., (Strategic political problems affecting accessibility of strategic and critical materials), executive session.
Cooley, Victor E., Deputy Director, Office of Defense Mobilization, Washington, D. C., part 10.
Cooper, J. W., Bronson-Cooper Mining Co., Monticello, Utah, part 9.
Coulter, Dr. John Lee, consulting economist, Washington, D. C., parts 10 and 7.
Cranmer, W. H. H., geologist, New York Mining Co., Salt Lake City, Utah, part 9.
Cullen, Herbert L., Miscellaneous Metals and Minerals Division, Business and Defense Services Administration, Department of Commerce, Washington, D. C., part 3.
Curtis, Francis J., vice president and director, Monsanto Chemical Co., St. Louis, Mo., part 10.
Curtis, Thomas, Chief, Ferroalloys Division, Office of Defense Mobilization, Washington, D. C., part 9.
Dawson, William A., Member of Congress from Utah, part 10.
DeSeversky, Maj. Alexander P., New York, N. Y., part 2.
Demmler, Ralph H., Chairman, Securities and Exchange Commission, Washington, D. C., part 10.
Director, Herman, statistician, Department of Commerce, Washington, D. C., part 10.
Douglas, Donald, president, Douglas Aircraft, Santa Monica, Calif., part 3.
Douglas, James H., Under Secretary of the Air Force, Washington, D. C. (Strategic political problems affecting accessibility of strategic and critical materials), executive session.
Downing, Warwick M., chairman, Oil and Conservation Commission of the State of Colorado, Denver, Colo., part 6.
Duce, Terry, the Arabian American Oil Co., Washington, D. C., part 6.
Duke, George L., manager of purchases, Aviation Gas Turbine Division, Westinghouse Electric Corp., South Philadelphis, Pa., part 9.
Duke, Rear Adm. I. T., USN, Assistant Chief of Naval Operations, Underseas Warfare, Washington, D. C., (Strategic political problems affecting accessibility of strategic and critical materials), executive session.
Dulles, Hon. John Foster, Secretary of State, Washington, D. C. (Strategic political problems affecting accessibility of strategic and critical materials), executive session.
Earnest, Frank W., president, Anthracite Institute, Wilkes-Barre, Pa., part 6.
Echols, Gen. Oliver P., Northrop Aircraft, Hawthorn, Calif., part 3.
Edwards, Ford K., National Coal Association, Washington, D. C., part 6.
Elggren, C. Allen, secretary-treasurer and director of the Consolidated Uranium Mines, Salt Lake City, Utah, part 9.
Elliott, Maxwell H., General Counsel, General Services Administration, Washington, D. C., parts 2 and 10.
Englestead, Van, director, CIO, Henderson, Nev., part 3.
Erickson, Victor, financial analyst, Office of the Comptroller, General Services Administration, Washington, D. C., part 2.
Ertl, Tell, professor of mining and petroleum engineering, Ohio State University, Columbus, Ohio, part 6.
Evans, John W., Office of International Materials Policy, Economic Affairs Division, State Department, Washington, D. C., part 4.
Fellers, Brig. Gen. Bonner, USA (retired), Washington, D. C., part 2.
Fick, Matt, director of panel on metals and minerals, Office of the Assistant Secretary of Defense for Research and Development, Washington, D. C., part 3.
Fieldner, Dr. A. C., Chief, Petroleum and Natural Gas Division, Bureau of Mines, Washington, D. C., part 6.

Fischnaller, H. R., president, United States Tin Corp., Seattle, Wash., part 10.
Flemming, Arthur S., Director, Office of Defense Mobilization, Washington, D. C.; parts 2, 3, and 10.
Fletcher, Andrew, president, St. Joseph Lead Co., New York, N. Y., part 10.
Floyd, Paul, nickel expert, Department of Commerce, Washington, D. C.; part 10.
Foley, J. W., vice president and assistant to chairman of the board, the Texas Co., New York, N. Y., part 6.
Forbes, John J., Director, Bureau of Mines, Washington, D. C., part 6.
Ford, John, Acting Chief, Contract Administration Branch, Materials Division, Emergency Procurement Service, Washington, D. C., parts 2 and 3.
Foster, William C., Manufacturing Chemists Association, Washington, D. C., part 10.
Franklin, Robert, National Wool Growers Association, Fresno, Calif., part 10.
Franks, Russell, manager, technical service and development, Electro Metallurgical Co., division of Union Carbide & Carbon Corp., Pittsburgh, Pa., part 9.
Frawley, E. G., president, Consolidated Uranium Mines, Salt Lake City, Utah, part 9.
Fredell, Clarence, Acting Chief, Expansion Branch, General Services Administration, Washington, D. C., part 2.
Garcia, John, State mine inspector, Santa Fe, N. Mex., part 9.
Garrett, John H., Executive Director of Metals Committee, Office of Assistant Secretary of Defense for Research and Development, Washington, D. C., part 3.
Gasque, Charles W., Jr., Assistant General Counsel, General Services Administration, Washington, D. C., part 2.
Gee, Edwin A., manager of plants technical section, pigments department, E. I. du Pont de Nemours & Co., Wilmington, Del., part 3.
Gelhouse, C. M., Fairchild Engine & Airplane Corp., Hagerstown, Md., part 3.
George, C. H., vice president, New Jersey Zinc Co., New York, N. Y., part 3.
Gerdan, Dimitrius, chief engineer, turbo jet engines, Allison division, General Motors Corp., Indianapolis, Ind., part 3.
Getzin, Edmund E., Metals and Minerals Staff, State Department, Washington, D. C., parts 4 and 10.
Gibson, Fred D., Nevada operations, Western Electrochemical Co., Henderson, Nev., part 3.
Gillespie, Tyrone, Dow Chemical Co., Midland, Mich., part 10.
Girdler, Walter H., Jr., vice president, Girdler Co., Louisville, Ky., part 10.
Glasco, L. M., president, West Coast Pipeline Co., Dallas, Tex., part 6.
Goldberg, D. C., manager, metallurgical engineering, Westinghouse Electric Corp., Philadelphia, Pa., part 9.
Goodridge, E. P., president, Horizons, Inc., Princeton, N. J., part 3.
Gordon, Louis D., Nevada Mining Association, Reno, Nev., part 10.
Gordy, Lowell, assistant supervisor, material control, Consolidated Vultee, San Diego, Calif., part 3.
Graham, Benjamin, New York, N. Y., part 5.
Green, Arthur W. F., chief metallurgist, Allison division, General Motors Corp., Indianapolis, Ind., part 9.
Greene, Albert H., Assistant General Counsel, General Services Administration, Washington, D. C., parts 2 and 9.
Gregg, Kenneth P., industrial engineer, 205 East 85th Street, New York, N. Y., part 10.
Gross, Robert, Lockheed Aircraft Corp., San Diego, Calif., part 3.
Gumbel, Irving, Director, Materials Division, General Services Administration, Washington, D. C., parts 2, 7, 9, and 10.
Gwinn, William P., vice president and general manager, Pratt-Whitney Aircraft, East Hartford, Conn., part 3.
Hahman, W. F., Administrator, Defense Solid Fuels Administration, Department of the Interior, Washington, D. C., part 6.
Haldane, W. E., president, Uranium Ore Producers Association, Grand Junction, Colo., part 9.
Hall, Durand A., Castro Mining Co., San Francisco, Calif., part 10.
Hall, William, vice president and plant manager, Vitro Chemical Co., Salt Lake City, Utah, part 9.
Hanink, Herman H., manager, metallurgical engineering, Wright Aeronautical Division, Curtiss-Wright Corp., Woodridge, N. J., part 9.
Hardey, B. A., past president, Independent Petroleum Association of America, Shreveport, La., part 6.

Hardy, Roy A., Nevada Mining Association, Reno, Nev., part 10.
Harvey, Leo M., president, Harvey Machine Co., Inc., Torrance, Calif., part 3.
Harwood, Julius J., Chief, Metallurgy Branch, Office of Research, Navy Department, Washington, D. C., part 3.
Hawes, Robert N., Hardwood Plywood Institute, Washington, D. C., part 10.
Heath, W. C., chief engineer, Solar Aircraft Co., San Diego, Calif., part 3.
Herres, Otto, Chairman, National Lead and Zinc Committee, Salt Lake City, Utah, part 10.
Hitchcock, L. M., staff engineer in charge of structures, engineering division, Boeing Aircraft, Seattle, Wash., part 3.
Holladay, E. L., research and development, Watertown Arsenal, Mass., part 3.
Holloway, J. L., president, Crane Co., Chicago, Ill., part 3.
Horn, Claude, Foreign Agricultural Service, Department of Agriculture, Washington, D. C., part 9.
Huggins, E. V., Westinghouse Electric Corp., New York, N. Y., part 10.
Hunter, T. H., Chief, Coal Branch, Fuels and Explosives Division, Bureau of Mines, Washington, D. C., part 6.
Hurley, Roy T., chairman of the board, Wright Aeronautical Division, Curtiss-Wright Corp., Woodridge, N. J., part 3.
Hussey, John B., Louisiana State conservation commissioner, Shreveport, La. part 6.
Ince, Charles, St. Joseph Lead Co., New York, N. Y., part 10.
Irving, Donald R., Ceramic and Fertilizer Branch, Bureau of Mines, Washington, D. C., part 1.
Jenness, L. G., Kennecott Copper Corp., New York, N. Y., part 3.
Johnson, Brig. Gen. Alfred H., United States Air Force, Staff Director, Petroleum Logistics Division, Office of the Assistant Secretary of Defense for Supply and Logistics, Washington, D. C., part 6.
Johnson, Charles H., Chief, Base Metals Branch, Bureau of Mines, Washington, D. C., part 1.
Johnson, Jesse C., Director, Division of Raw Materials, Atomic Energy Commission, Washington, D. C., part 9 and executive session.
Jones, J. M., executive secretary, National Wool Growers Association, Salt Lake City, Utah, part 10.
Jones, John T., international executive board member and president, District No. 16, United Mine Workers of America, Washington, D. C., part 6.
Josephson, G. W., Chief, Construction and Chemical Materials Branch, Bureau of Mines, Washington, D. C., part 1.
Josephson, Dr. H. R., Forest Service, Department of Agriculture, Washington, D. C., part 9.
Kaiser, Edward P. Geological Survey, Denver, Colo., part 9.
Kallina, Carl T., Chief, Division of Gas Certificates, Federal Power Commission, Washington, D. C., part 6.
Kellogg, Prof. Herbert H., Chairman, Titanium Advisory Committee, Office of Defense Mobilization, Washington, D. C., part 3.
Kendall, Charles, General Counsel, Office of Defense Mobilization, Washington, D. C., part 10.
Kennedy, Miles D., National Legislative Director, The American Legion, Washington, D. C., part 10.
Kennedy, Thomas, vice president, United Mine Workers of America, Washington, D. C., part 6.
Kennon, Hon. Robert F., Governor of Louisiana, Baton Rouge, La., part 6.
King, Clark, executive vice president, Allegheny Ludlum Steel Co., Pittsburgh, Pa., part 9.
Kinzel, Augustus B., vice president, Electro Metallurgical Division, Union Carbide & Chemical Co., Inc. New York, N. Y., part 3.
Kline, Mitchell H., Chief, Rare and Precious Metals, Bureau of Mines, Washington, D. C., parts 1 and 9.
Knickerbocker, R. G., Regional Director, Region III, Rolla, Mo., part 9.
Knorr, Dr. Klaus, Princeton University, Princeton, N. J., part 5.
Kurtz, W. T., National Coal Association, Washington, D. C., part 6.
La Fortune, Joseph A., Deputy Administrator, Petroleum Administration for Defense, Washington, D. C., part 6.
Lamb, George A., manager of business surveys, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa., part 6.
Lanphier, Tom, vice president for long-range planning for Convair, Consolidated Vultee, San Diego, Calif., part 3

Li, K. C., Wah Chang Corp., New York, N. Y., part 10.
Lilly, Frank, Spokane, Wash., part 10.
Lincoln, Dr. Rush, Chief Metallurgist, Allegheny Ludlum Steel Co., Pittsburgh, Pa., part 9.
Lippolt, R. J., Director, Defense Accounts Division, General Services Administration, Washington, D. C., part 2.
Livengood, William S., Secretary of Internal Affairs, Commonwealth of Pennsylvania, Harrisburg, Pa., part 6.
Lloyd, Lewis E., Dow Chemical Co., Midland, Mich., part 10.
Lloyd, Rex R., Director, Bureau of Mines, Boulder City, Nev., part 3.
Lohse, Fred, Kaiser Aluminum & Chemical Corp., Oakland, Calif., part 3.
Long, W. Lunsford, Haile Mines, Inc.; Tungsten Mining Corp.; Manganese, Inc., Warrenton, N. C., part 10.
Lottridge, R. W., Pioche Manganese Co., Henderson, Nev., part 3.
Lourie, Donald, Under Secretary of State for Administration, Washington, D. C., Part 4.
Lynn, Harold Frederick, Consulting Engineer, 8760 Shoreham Drive, Los Angeles, Calif., part 10.
McBride, H. D., manager, oxide division, Monolith Portland Midwest Co., Los Angeles, Calif., part 10.
McCarroll, Sidney J., Manganese, Inc., Henderson, Nev., part 3.
McCoy, H. B., Deputy Administrator, Business Defense Services Administration, Department of Commerce, Washington, D. C., part 10.
McCreary, F. E., vice president, engineering, Rohr Aircraft Co., Chula Vista, Calif., part 3.
McKay, Douglas, Secretary of the Interior, Washington, D. C., parts 1 and 6.
McKinnon, W. F., Chief, Tin and Fiber Branch, Reconstruction Finance Corporation, Washington, D. C., part 10.
McNamara, B. J., purchasing manager, Pratt-Whitney Aircraft, East Hartford, Conn., part 3.
McNichols, Stephen, Uranium Ore Producers Association, Denver, Colo., part 9.
Macey, W. B., chief engineer, New Mexico Oil Conservation Commission, Santa Fe, N. Mex., part 6.
Mackey, D. H., assistant sales manager, Simonds Saw & Steel Co., Lockport, N. Y., part 10.
Madison, Dr. Elihu, Director, Program Division, Petroleum Administration for Defense, Washington, D. C., part 6.
Magrath, M. G., Delta, Colo., part 9.
Maley, Leo, Dove Creek, Colo., part 9.
Mansure, Edmund F., Administrator, General Services Administration, Washington, D. C., parts 3 and 10.
Marshall, Capt. W. J., United States Navy, executive assistant to Chief of Naval Operations, Washington, D. C., (strategic political problems affecting accessibility of strategic and critical materials) (executive session).
Martin, Thomas E., Member of Congress, Iowa, parts 1 and 2.
Martindale, Roy, consulting engineer, Stauffer Chemical Co., Los Angeles, Calif., part 3.
Mason, Dr. Edward S., Littauer Center, Harvard University, Cambridge, Mass., part 8.
Mastin, M. G., Bureau of Mines, Boulder City, Colo., part 3.
May, Dr. Timothy C., Office of Assistant Secretary of Defense, Supply and Logistics, Washington, D. C., part 3.
Medley, Max K., Comptroller, General Services Administration, Washington, D. C., part 2.
Melcher, Norwood B., Chief, Ferreous Metals and Alloys Branch, Bureau of Mines, Washington, D. C., part 1.
Merrill, Charles, Assistant Chief, Minerals Division, Bureau of Mines, Washington, D. C., part 10.
Mesick, Col. Benjamin S., commanding officer, Watertown Arsenal, Mass., part 3.
Metzger, Maj. Gen. Kern D., United States Air Force, Chief, Production and Resources Division, Air Materiel Command, Dayton, Ohio, parts 3 and 9.
Mevi, Albert, Tartaric Raw Materials, New York, N. Y., part 10.
Miller, Tom, Assistant Director, Bureau of Mines, Department of the Interior, Washington, D. C., part 1.
Mittendorf, Clarence C., Administrator, Defense Minerals Exploration Administration, Washington, D. C., part 9.
Mochel, Norman L., Westinghouse Electric Corp., Philadelphia, Pa., part 3.

Mock, Bryan, regional director, Bureau of Land Management, Department of the Interior, Salt Lake City, Utah, part 9.
Moody, Joseph, Assistant General Counsel for Real Property, General Services Administration, Washington, D. C., part 10.
Moody, Joseph E., Southern Coal Producers Association, Washington, D. C., part 6.
Moore, Doxie, director of the conservation department, Indianapolis, Ind., part 6.
Moore, Julian, Basic Management, Inc., Henderson, Nev., part 3.
Moore, Perry, mining engineer, General Services Administration, Washington, D. C., part 9.
Morgan, John D. Jr., special assistant to the Assistant Director Office of Defense Mobilization, Washington, D. C., parts 7 and 9.
Morse, Richard S., Massachusetts National Research Corp., Cambridge, Mass., part 3.
Morse, True D., Under Secretary of Agriculture, Washington, D. C., part 9.
Morton, Thruston B., Assistant Secretary of State for Congressional Relations, Washington, D. C.
Mosier, Harold, Aircraft Industries Association, Shoreham Building, Washington, D. C., part 3.
Moskovics, Frederick F., special consultant to commanding general, Air Materiel Command, Dayton, Ohio, part 3.
Moudry, G. A., chief metallurgist, Harvey Machine Co., Inc., Torrance, Calif., part 3.
Mulcahy, P. H., chairman, Utah State Land Board, Salt Lake City, Utah, part 9.
Murthfeldt, F. Harold, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., part 10.
Nason, Edgar F., general sales manager, Elastic Stop Nut Corporation of America, Union, N. J., part 3.
Neumann, C. F., Colorado River Commission, Henderson, Nev., part 3.
Nichols, C. W., Acting Deputy Director, Office of Materials Policy, Department of State, Washington, D. C., parts 5 and 10.
Nichols, Gen. Kenneth D., General Manager, Atomic Energy Commission, Washington, D. C., (strategic political problems affecting accessibility of strategic and critical materials) (executive session).
O'Donnell, William, chief development engineer, Republic Aviation Corp., Farmingdale, Long Island, N. Y., part 3.
Olson, Clarence H., assistant legislative director, the American Legion, Washington, D. C., part 10.
Paley, William S., chairman of the board, Columbia Broadcasting System, New York, N. Y., part 8.
Palik, John, president, National Plating Corp., Cleveland, Ohio, part 10.
Palmer, Robert S., Colorado Mining Association, Denver, Colo., part 10.
Papen, George, Lockheed Aircraft Corp., San Diego, Calif., part 3.
Parnell, F. L., executive assistant of financial policy, Office of Defense Mobilization, Washington, D. C., part 7.
Parsons, Arthur B., mining engineer and mineral economist, tax consultant, Oakland, Calif., part 7.
Pehrson, Elmer W., regional director, Foreign Minerals Region, Bureau of Mines, Washington, D. C., part 1.
Pew, James E., natural gas division, Sun Oil Co., Philadelphia, Pa., part 6.
Pick, Vernon, Pick Uranium Co., Grand Junction, Colo., part 9.
Pickett, Tom, executive vice president, National Coal Association, Washington, D. C., part 6.
Porter, Jack, Houston, Tex., part 6.
Porter, Robert P., Porter Bros. Corp., Boise, Idaho, part 9.
Promisel, N. E., Bureau of Aeronautics, Navy Department, Washington, D. C., part 3.
Pullian, Keeling, Kobe Steel Company of Japan, Los Angeles, Calif., part 3.
Quisenberry, Dr. K. S., Agricultural Research Service, Department of Agriculture, Washington, D. C., part 9.
Ralston, Oliver C., Chief Metallurgist, Bureau of Mines, Washington, D. C., parts 1 and 9.
Rawlings, T. R., Commodity Stabilization Service, Department of Agriculture, Washington, D. C., part 9.
Raynes, Burt, vice president, manufacturing, Rohr Aircraft Co., Chula Vista, Calif., part 3.

Renick, Abbott, commodity analyst, Bureau of Mines, Washington, D. C., part 10.
Richards, Earl, Republic Steel Corp., Washington, D. C., part 3.
Roberts, Richard H., Foreign Agricultural Service, Department of Agriculture, Washington, D. C., part 9.
Robertson, Jeff A., Corporation Commission of Kansas, Topeka, Kans., part 6.
Roemer, James A., Mallory-Sharon Titanium Corp., Niles, Ohio, part 3.
Rogers, C. H., Governor of Wyoming, Cheyenne, Wyo., part 6.
Rolle, Carl, member of staff of Assistant Secretary of Defense for Supply and Logistics, Department of Defense, Washington, D. C., parts 2 and 3.
Romm, Joseph, Office of Assistant Secretary of Defense for Supply and Logistics, Washington, D. C., part 3.
Romney, Miles P., manager, Utah Mining Association, Salt Lake City, Utah, parts 9 and 10.
Rowley, E. R., president, Titanium Metals Corporation of America, Henderson, Nev., part 3.
Rubel, A. C., vice president, Union Oil Co. of Calif., Los Angeles, Calif., part 6.
Rummel, G. T., La Salle Mining Co., chairman, Colorado Plateau uranium committee of the Colorado Mining Association, Grand Junction, Colo., part 9.
Segerstrom, Charles H., Nevada-Massachusetts Co., Sonora, Calif., part 10.
Seymour, Frank, Colorado Mining Association, Grand Junction, Colo., part 9.
Scales, O. L., vice president, Enos Coal Co., Indianapolis, Ind., part 6.
Schieck, DeWitt C., Cordage Institute, Washington, D. C., part 10.
Schreiber, Morris, secretary of the Eastern States Retail Solid Fuels Conference, New York, N. Y., part 6.
Scott, C. H., president, Magnet Cove Titanium Corporation, Denver, Colo, part 9.
Seaton, Fred A., Assistant Secretary of Defense for Legislative and Public Affairs, Washington, D. C. (strategic political problems affecting accessibility of strategic and critical materials), (executive session).
Shackman, Alexander, director, North Coast Beach Minerals, Sydney, Australia, part 3.
Sheedy, James T., Rayonier, Inc., New York, N. Y., part 10.
Shock, Raymond M., executive secretary, National Association of Metal Finishers, Washington, D. C., part 10.
Smith, Harry, Assistant Administrator, Department of Commerce, Washington, D. C., part 10.
Smith, Rollin P., plant manager, Titanium Metals Corporation of America, Henderson, Nev., part 3.
Spalding, L. P., engineer, North American Aviation Corp., Inglewood, Calif., part 3.
Spaatz, General Carl A., USAF, Washington, D. C., part 10.
Sperka, H. C., manager, Standard & Graphic Arts Marathon Corp., Menasha, Wis., part 10.
Stalker, K. W., engineering department, aircraft gas turbine division, general Electric Co., Cincinnati, Ohio, part 3.
Steen, Charles A., president and chief geologist, Utex Exploration Co., Moab, Utah, part 9.
Stewart, H. A., Acting Director of Oil and Gas Division, Petroleum Administration for Defense, Washington, D. C., part 6.
Stibravy, William J., special assistant to the Director, Office of Financial and Development Policy, Department of State, Washington, D. C., part 5.
Storch, H. H., Synthetic Liquid Fuels Branch, Bureau of Mines, Washington, D. C., part 6.
Strackbein, O. R., chairman, Nationwide Committee of Industry, Agriculture, and Labor on Import-Export Policy, part 10.
Strauss, Lewis L., Chairman, Atomic Energy Commission, Washington, D. C. (strategic political problems affecting accessibility of strategic and critical materials) (executive session).
Sullivan, R. G., Salt Lake Tungsten Refinery, Salt Lake City, Utah, part 9.
Talbott, Hon. Harold E., Secretary of the Air Force, Washington, D. C., part 3.
Taylor, Joseph H., Peru Mining Co.,and New Mexico Consolidated Mining Co., subsidiaries of Illinois Zinc Co., Silver City, N. Mex., part 10.
Thielemann, R. H., development metallurgist, Pratt Whitney Aircraft Corp., East Hartford, Conn., part 9.
Thomas, Charles S., Assistant Secretary of Defense, Department of Defense, Washington, D. C., part 3.
Thompson, J. Murray, Commodity Stabilization Service, Department of Agriculture, Washington, D. C., part 9.

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Twining, General Nathan F., Chief of Staff, United States Air Force, Washington, D. C. (strategic political problems affecting accessibility of strategic and critical materials) (executive session).
Urheim, B. E., executive secretary, American Retail Coal Association, Chicago, Ill., part 6.
Vandenburg, Frank H., Mallory-Sharon Titanium Corp., Niles, Ohio, part 3.
Wainer, Eugene, director of research, Horizons, Inc., Princeton, N. J., part 3.
Walsh, A. J., Commissioner, Emergency Procurement Service, General Services Administration, Washington, D. C., part 2.
Walstrom, J. A., Shell-Caribbean Petroleum Co., New York, N. Y., part 6.
Wartman, Frank S., Bureau of Mines, Boulder City, Nev., part 3.
Waters, T., Thomas A. Edison, Inc., West Orange, N. J., part 10.
Waugh, Samuel, Assistant Secretary of State for Economic Affairs, Washington, D. C., parts 4 and 5.
Weaver, Elmer, H., Assistant Director (Materials), Office of Defense Mobilization, Washington, D. C., part 9.
Wedemeyer, Lt. Gen. Albert C., United States Army (retired), New York, N. Y., part 2.
Weiss, Samuel, president, American Coke & Coal Chemicals Institute, Washington, D. C., part 6.
West, Hewitt S., Manganese, Inc., Henderson, Nev., part 10.
Wilkin, Carl, Joint Committee on Defense Production, Washington, D. C., part 10.
Wilkinson, Edwin, National Association of Wool Manufacturers, New York, N. Y., part 10.
Willis, Charles F., Arizona Small Mine Operators Association, Phoenix, Ariz., part 10.
Williston, Sam H., Cordero Mining Co., Palo Alto, Calif., part 10.
Wilson, Blakely, vice president, Plainville Electro Plating Co., Plainville, Conn., part 10.
Wilson, Hon. Charles E., Secretary of Defense, Washington, D. C. (strategic political problems affecting accessibility of strategic and critical materials) (executive session).
Wilson, R. E., mining engineer, General Services Administration, Washington, D. C., part 9.
Winant, Frederick, special assistant to the Assistant Director, Office of Defense Mobilization, Washington, D. C., part 4.
Wood, F. T., chief materials process engineer, Douglas Aircraft, Santa Monica, Calif., part 3.
Woodward, Jack, member executive committee, Texas Independent Producers and Royalty Owners Association, Austin, Tex., part 6.
Worcester, Harold S., Colorado Mining Association, Denver, Colo., part 9.
Wormser, Felix E., Assistant Secretary of the Interior, Washington, D. C., part 1.
Wyatt, E. E., executive assistant to the president, Crane Co., Chicago, Ill., part 3.
Zinner, Paul, Chief, Minerals Division, Bureau of Mines, Washington, D. C., part 1.

APPENDIX IV

HARRY DEXTER WHITE MEMORANDA OBTAINED FROM PRINCETON UNIVERSITY LIBRARY AND FILES OF TREASURY DEPARTMENT

MARCH 7, 1944.

Subject: Proposed United States Loan to the U. S. S. R.
To: Secretary Morgenthau
From: Mr. White

The following memorandum is in reference to your request that the feasibility of the extension of a large credit to the U. S. S. R. in exchange for needed strategic raw materials be explored. Your opinion that such an arrangement might well be feasible appears to us to be supported by our study of the possibilities.

1. Recent confidential reports on our raw material resources prepared for the Under Secretary of Interior disclose an increasing dependence of the United States on foreign sources of supply for strategic raw materials because domestic reserves have been seriously diminished or virtually depleted.

2. The following table indicates the extent of United States current reserve supplies for some important strategic materials which can be produced in quantity in the U. S. S. R., in terms of prewar and current war, domestic requirements:

Reserve domestic supplies

	On basis of our 1938 domestic consumption	On basis of our current consumption 1943
Petroleum	16 years' supply	13 years' supply.
Manganese	9 years' supply	3 years' supply.
Tungsten	23 years' supply	Do.
Zinc	17 years' supply	8 years' supply.
Lead	7 years' supply	6 years' supply.
Chrome	No record	Less than 1 year's supply.
Mercury	3 years' supply	2 years' supply.

3. It is evident from the above table that, although our domestic reserves of petroleum, tungsten, and zinc may suffice to meet consumption requirements for the next decade, they will be almost entirely dissipated by the end of that period; in the case of manganese, chrome, mercury, and lead our resources are too limited to satisfy even probable domestic requirements of the next 10 years. The number of strategic materials for which our reserves are very low and which can be produced in the U. S. S. R. is greater than indicated above, and includes platinum, vanadium, graphite, and mica.

4. Although our reserves of strategic materials could be somewhat expanded, given an increase in price to make possible further development of marginal resources, the necessity of growing United States dependence on foreign sources of supply in order to satisfy anticipated postwar industrial requirements and to maintain adequate security reserves, is inescapable. (See attachment I for complete table on United States metal reserves.)

U. S. S. R., UNTAPPED RAW MATERIALS RESERVOIR

1. The U. S. S. R. is richly provided with a wide range of strategic raw materials, including metals, minerals, timber, and petroleum, but the unequal degrees to which these have been developed will limit the number and volume that may be available for export in the immediate postwar years.

2. Rapid economic reconstruction and expanded resources development could greatly enhance the export surplus of the U. S. S. R., could sustain large scale exports of metal and metallic ores, petroleum, and timber at an average annual value of at least $500 million, not including exports of other materials such as furs and semimanufactures.

3. It therefore appears that a financial agreement whereby the United States would extend a credit of $5 billion to the U. S. S. R. for the purchase of industrial and agricultural products over a 5-year period, to be repaid in full over a 30-year period, chiefly in form of raw material exports, would not only be advantageous to the United States, as well as helpful to the U. S. S. R. but would be within the limits of feasible trade between the two countries, since the amount we would wish to purchase would be in excess of the repayment which the U. S. S. R. would be required to make under the proposed loan terms. (See attachment II for suggested terms of U. S. S. R. repayment for United States credits.)

IS THE PROPOSED FINANCIAL AGREEMENT PRACTICAL AND DESIRABLE?

The proposed financial agreement appears practical because:

1. The prewar restricted pattern of trade should not be used to define the potentials of postwar trade between the United States and U. S. S. R. since both economies have been fundamentally restructured by the war. In both the United States and U. S. S. R. the accelerated expansion of production capacity and national output which has been achieved during the last 3 years indicates the new and larger dimensions which foreign trade can assume in both economies in the postwar period. (See attachment III for a summary of United States-U. S. S. R. trade relations during the interwar period 1918–38.)

(*a*) The low level of prewar international trade relations were both a symptom and a cause of deteriorated economic and political international relations. It is realistic to assume that as compared with prewar years a decreasing proportion of expanding Soviet resources will be devoted to war industries, thereby creating an enlarged export potential through the release of resources.

3. Since the U. S. S. R. has completely state-controlled economy, the extent and character of its surpluses and deficits (i. e., imports and exports) are largely

determined by planning decisions covering the allocation of manpower, materials and equipment, it will be possible for the United States to influence the Soviet pattern of anticipated national surpluses and deficits.

4. If United States trade plans are premised on an expanded volume of trade and a correlative increase of United States import requirements, the expansion of trade between the United States and U. S. S. R. need not necessarily involve a reduction in total United States imports from other areas.

The proposed financial agreement appears desirable because:

1. The United States will obtain access to an important source of strategic raw materials which are expected to be in short supply in the United States after the war.

2. The United States will also be assured an important market for its industrial products since the U. S. S. R. represents one of the largest single sources of demand in Europe and is ideally suited to supply us with a large and varied backlog of orders for both producers' and consumers' goods. Such a sustained demand could make an important contribution to the maintenance of full employment during our transition to a peace economy.

3. Moreover, the United States will not only be assured a desirable market because of the anticipated volume of demand the U. S. S. R. will exercise, but because of its superior repayment potential compared with other foreign buyers of American products.

4. An arrangement of this character would provide a sound basis for continued collaboration between the two Governments in the postwar period.

HARRY DEXTER WHITE.
WILLIAM HENRY TAYLOR.
IRVING S. FRIEDMAN.
SONIA GOLD.

LETTER FROM SECRETARY OF TREASURY TO THE PRESIDENT UNDATED AND UNSIGNED, ON SECRETARY OF THE TREASURY LETTERHEAD

JANUARY 10, 1945.

Memorandum for the President.

A $10 BILLION RECONSTRUCTION CREDIT FOR THE U. S. S. R.

I suggest consideration be given to a financial arrangement with the U. S. S. R. to provide her with $10 billion credits for the purchase of reconstruction goods in the United States, with provision for repayment to us chiefly in strategic raw materials in short supply in the United States.

1. The interest rate could be 2 percent, amortized over a period of 35 years. A schedule of repayments is attached.

2. The Russians have more than adequate means to assure full repayment. There are three principal sources from which she can obtain the necessary amount of dollars.

(*a*) Selling to us strategic raw materials which are in short supply in the United States because of our depleted natural resources. (See attached memorandum.)

(*b*) Russia will be able to develop substantial dollar assets from tourist trade, exports of nonstrategic items to the United States, and from a favorable balance of trade with the rest of the world.

(*c*) Russia has a stock of gold estimated at $2 billion now and is reported to be able to produce from $150 to $250 million per year. These gold resources can be used to pay her obligations to the United States to the extent that her other dollar sources are not adequate.

3. An important feature of this proposal is that we will be conserving our depleted natural resources by drawing on Russia's huge reserves for current needs of industrial raw materials in short supply here. We would be able to obtain a provision in the financial agreement whereby we could call upon Russia for whatever raw materials we need without giving a commitment on our part to buy.

4. This credit to Russia would be a major step in your program to provide 60 million jobs in the post-war period.

CONSERVATION OF UNITED STATES NATURAL RESOURCES AND IMPORTS FROM THE U. S. S. R.

The United States has had to draw heavily on domestic raw-material reserves during the war to meet peak production requirements. The following table prepared from some recent confidential reports for the Secretary of Interior discloses the depleted natural resources of the United States, and emphasizes the need for conservation measures.

Reserve domestic supplies

	On the basis of our 1939 domestic consumption	On the basis of our current consumption, 1943
	Years supply	*Years supply*
Petroleum	16	13
Manganese	9	3
Tungsten	23	3
Zinc	17	8
Lead	7	6
Chrome	(1)	(2)
Mercury	3	

[1] No record.
[2] Less than 1 year's supply.

We could safeguard and conserve our strategic material reserves in postwar years which are now at a minimum level, by importing from abroad to meet ordinary annual production requirements. The U. S. S. R. has tremendous reserves of many materials which the United States will urgently require after the war. A reconstruction loan to the U. S. S. R. will give the means whereby we can conserve our natural resources for the next two generations, by utilizing Russian reserves. The U. S. S. R. could provide substantial quantities of strategic raw materials for an annual basis within 5 years after the close of the war as indicated in the following table:

Metals and metallic ores (manganese, tungsten, graphite, mica, chrome, mercury, iron ore, platinum, copper)	$80, 000, 000
Timber and wood products	45, 000, 000
Petroleum	50, 000, 000
Oils and oilcake	10, 000, 000
Other industrial raw materials	15, 000, 000
Total	200, 000, 000

Repayment schedule for advance of $10 billion credit for 35 years at 2 percent[1]

[Millions of dollars]

Year	Scheduled expenditures	Annual interest	Annual schedule of repayment	Unpaid balance at end of year
1	1,000	20	0	1,020
2	2,500	70	0	3,590
3	3,000	132	0	6,722
4	2,500	184	100	9,307
5	1,000	206	150	10,513
6		210	200	10,523
7		210	250	10,484
8		210	300	10,393
9		208	350	10,251
10		205	400	10,056
11		201	400	9,857
12		197	400	9,655
13		193	400	9,448
14		189	400	9,237
15		185	500	8,922
16		178	500	8,601
17		172	500	8,273
18		165	500	7,938
19		159	500	7,597
20		152	500	7,249
21		145	500	6,894
22		138	500	6,532
23		131	500	6,162
24		123	500	5,785
25		116	600	5,301
26		106	600	4,807
27		96	600	4,303
28		86	600	3,789
29		76	600	3,265
30		65	600	2,730
31		55	600	2,185
32		44	600	1,629
33		33	600	1,061
34		21	600	483
35		10	492	
Total		4,691	14,842	

[1] This schedule is a basis for negotiation.

[Attachment I]

Estimated production, consumption, prices and reserves of selected important minerals in 1943

Mineral	Estimated production (thousand units)	Estimated average price (millions)	Estimated domestic consumption (thousands)	Estimated price (millions)	Current estimated reserves (thousand units)	Reserve supply in terms of current annual consumption (years)
Bituminous coal ..... standard tons	589,000	$1,561	582,000	$1,542	1,407,808,291	2,419
Anthracite ..... do	60,327	302	56,800	284	15,415,602	271
Petroleum ..... barrels	1,503,000	1,819	1,507,000	1,823	19,017,756	13
Iron ore ..... standard tons	113,554	275	111,500	270	1,715,000	15
Manganese, 35 percent Mn ..... long tons	172	----------	1,400	----------	4,550	3
Chromite, all grades ..... do	109	3	900	30	20	(2)
Vanadium ..... standard tons	2.7	3	3.4	4	3.8	1
Tungsten ..... do	5.7	----------	10	----------	34.6	3
Molybdenum ..... do	29.5	42	25.1	36	800	32
Copper ..... do	1,088	283	1,624	422	25,000	15
Lead ..... do	446	66	717	106	4,000	6
Zinc ..... do	741	167	900	203	7,000	8
Mercury ..... flasks	53.5	10	55.2	11	110	2
Bauxite, all grades ..... standard tons	7,026	27	5,340	21	18,000	4
Fluorspar ..... do	408	12	386	12	10,000	26
Magnesite ..... do	860	9	860	9	50,000	58
Phosphate rock ..... do	5,600	21	5,208	19	3,322,000	714
Potash (K_2O) ..... do	700	24	630	21	75,000	119
Sulfur ..... do	3,100	50	2,900	40	94,000	32

[1] Magnesite plus dolomite.

[2] Less than 1 year.

Source: Preliminary estimates of reserves of important minerals in the ground as of Jan. 1, 1945, Department of Interior, Geological Survey.

United States imports and exports of selected important minerals

Commodity	Value in dollars	Exports 1938, quantity	Imports, 1938	
			Value in dollars	Quantity
Bituminous coal	(1)	10,490,000 long tons	(1)	241,000 long tons.
Anthracite coal	(1)	1,909,000 long tons	(1)	363,000 long tons.
Petroleum	(1)	51,222,000 barrels	(1)	26,000,000 barrels.
Iron ore	1, 954, 000	592,000 long tons	5, 288, 000	2,122,000 long tons.
Manganese ore	(1)	(1)	6, 919, 000	484,000 long tons.
Chromite	(1)	(1)	4, 855, 000	352,000 long tons.
Vanadium	(1)	(1)	891, 000	10 short tons.
Tungsten	(1)	(1)	139, 000	162,000 pounds.
Molybdenum	(1)	(1)	81	25 pounds.
Copper	86, 119, 000	844,027,000 pounds	(1)	504,000,000 pounds.
Lead	3, 355, 000	46,000 short tons	(1)	64,000 short tons.
Zinc	1, 271, 000	8,000 short tons	(1)	19,000 short tons.
Mercury	(2)	(2)	133, 000	179,000 pounds.
Bauxite	1, 459, 000	57,000 long tons	3, 521, 000	455,000 long tons.
Fluorspar	9, 061	788 short tons	287, 000	19,000 short tons.
Magnesite and dolomite	(2)	(2)	479, 000	27,000 short tons.
Phosphate rock	6, 637, 000	1,140,000 long tons	80, 000	7,004 short tons.
Potash K_2O	2, 599, 000	84,000 short tons	13, 500, 000	193,000 short tons.
Sulfur	10, 332, 000	575,000 long tons	562, 000	51 long tons.
Graphite	112, 000	983 short tons	372, 000	17,000 short tons.
Mica	183, 000	2,000 short tons	664, 000	5,761 short tons.
Platinum	1, 166, 000	33 troy ounces	4, 366, 000	161 troy ounces.

[1] Data not available.
[2] Not exported in quantity.

Draft Of Letter, Secretary Of The Treasury Morganthau To President Truman

The Secretary of the Treasury,
Washington (Undated).

The President,
The White House.

My Dear Mr. President: During the last year I have discussed several times with Mr. Harriman a plan which we in the Treasury have been formulating for comprehensive aid to Russia during her reconstruction period. We are not thinking of more lend lease or any form of relief but rather of an arrangement that will have definite and long range benefits to the United States.

Ambassador Harriman has expressed great interest and would like to see the plan advanced. I understand from him that the Russians are reluctant to take the initiative, but would welcome our presenting a constructive program.

You will recall that at Quebec Mr. Churchill showed every evidence that his greatest worry was the period immediately following V–E day. We have now worked out the phase 2 lend-lease program with the British after 2 months very hard work.

I am convinced that if we came forward now and presented to the Russians a concrete plan to aid them in the reconstruction period, it would contribute a great deal toward ironing out many of the difficulties we have been having with respect to their problems and policies.

I hope that you will give me an opportunity to present to you the work which we have been doing here in the Treasury over a period of a year on this subject.

I am furnishing Mr. Stettinius with a copy of this letter for his consideration.

Sincerely,

———— ————.

Statement by the President in Approving S. 752 (Stockpile Act) on July 23, 1946

I have today signed the Strategic and Critical Materials Stockpiling Act because it is important to the national interest that this Government have the power to acquire stockpiles.

It is only because of the overriding importance of this purpose that I am able to overcome my reluctance to signing a bill which reaffirms the application to

stockpile purchases of the provisions of title III of the act of March 3, 1933 (47 Stat. 1520), known as the Buy American Act. Those provisions will not only materially increase the cost of the proposed stockpiles but will tend to defeat the conservation and strategic objectives of the bill by further depleting our already inadequate underground reserves of strategic materials. Furthermore, there can be a serious conflict between those provisions and the foreign economic policy which this Government is actively pursuing. It also seems to me that the application of the Buy American Act may frequently hamper the effective achievement of the essential purpose of the legislation which is to enlarge the stock of vital raw materials available within our borders in time of possible emergency.

The Buy American Act requires that only articles produced or manufactured from materials originating in the United States shall be purchased for public use. However, the act also provides that exceptions to this rule may be made when buy American purchases are determined "to be inconsistent with the public interest or the cost to be unreasonable." This provision clearly indicates that the stockpiling program should not be used as a means of generally subsidizing those domestic producers who otherwise could not compete successfully with other domestic or foreign producers. Furthermore, to insure that the necessary stockpiles are accumulated as rapidly as deemed advisable and with a minimum cost to the public, this act should not be used as a device to give domestic interests an advantage over foreign producers of strategic materials greater than that provided by the tariff laws.

It is the policy of this Government to work for international action to reduce trade barriers. We have proposed to other countries a set of principles governing trade, and look forward to the successful conclusion of broad international arrangements embodying the essential principles of these proposals. Pending the conclusion of such arrangements, it is the policy of this Government to avoid taking measures that will raise barriers to trade or prejudice the objectives of the forthcoming discussions. We are asking other countries to follow similar policies.

The United States is opposed to governmental policies fostering autarchy, for itself as well as for others. Encouragement of uneconomic domestic production and unjustified preferential treatment of domestic producers destroys trade and so undermines our national economic strength. A large volume of soundly based international trade is essential if we are to achieve prosperity in the United States, build a durable structure of world economy, and attain our goal of world peace and security.

APPENDIX V

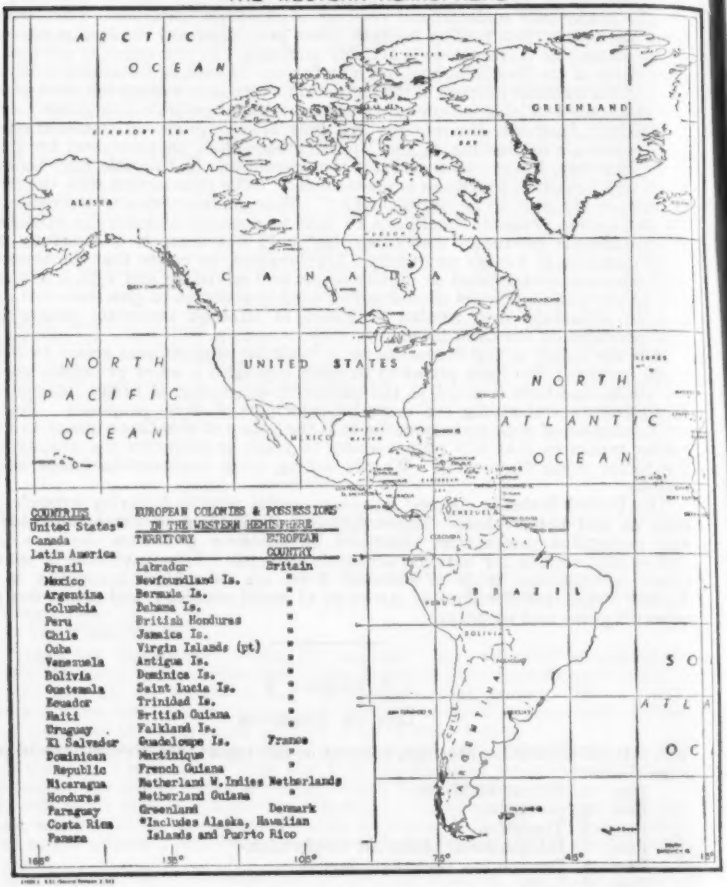
LIST OF HEARINGS

The printed committee hearings, covered in this report, are divided into 10 parts as follows:

Part 1. Bureau of Mines.
Part 2. Stockpile.
Part 3. Titanium.
Part 4. International Materials Conference.
Part 5. Commodity trade agreements.
Part 6. Fuels.
Part 7. Tariffs and taxes.
Part 8. Paley Commission, staff study.
Part 9. Uranium, columbium, cobalt, rutile, and strategic agricultural products.
Part 10. Industry.

APPENDIX VI

THE WESTERN HEMISPHERE



COUNTRIES	EUROPEAN COLONIES & POSSESSIONS IN THE WESTERN HEMISPHERE	
	TERRITORY	EUROPEAN COUNTRY
United States*		
Canada		
Latin America		
Brazil	Labrador	Britain
Mexico	Newfoundland Is.	"
Argentina	Bermuda Is.	"
Columbia	Bahama Is.	"
Peru	British Honduras	"
Chile	Jamaica Is.	"
Cuba	Virgin Islands (pt)	"
Venezuela	Antigua Is.	"
Bolivia	Dominica Is.	"
Guatemala	Saint Lucia Is.	"
Ecuador	Trinidad Is.	"
Haiti	British Guiana	"
Uruguay	Falkland Is.	"
El Salvador	Guadeloupe Is.	France
Dominican Republic	Martinique	"
	French Guiana	"
Nicaragua	Netherland W. Indies	Netherlands
Honduras	Netherland Guiana	"
Paraguay	Greenland	Denmark
Costa Rica	*Includes Alaska, Hawaiian Islands and Puerto Rico	
Panama		

ALPHABETICAL LISTING OF COUNTRIES

North America:
- Alaska
- Canada
- Greenland
- Iceland
- Mexico
- United States

Central America:
- British Honduras
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- Nicaragua
- Panama

Caribbean islands:
- Greater Antilles:
  - Cuba
  - Dominican Republic
  - Haiti
  - Jamaica
  - Puerto Rico
- Caribbean islands—Continued
- Lesser Antilles:
  - Bahama Islands
  - Bermuda Island
  - Trinidad Island

South America:
- Argentina
- Bolivia
- Brazil
- British Guiana
- Chile
- Colombia
- Ecuador
- French Guiana
- Paraguay
- Peru
- Surinam
- Uruguay
- Venezuela

APPENDIX VII

THE STATE OF TEXAS,
EXECUTIVE DEPARTMENT,
Austin, Tex., November 27, 1953.

Hon. GEORGE W. MALONE,
Chairman, Minerals, Materials, and Fuels Economic Subcommittee,
Senate Office Building, Washington, D. C.

DEAR SENATOR MALONE: I appreciate your invitation to file my statement concerning the important study being conducted by our Fuels Subcommittee "of the accessibility of critical and strategic raw materials to the United States in time of war and methods of encouraging development to assure the availability of supplies of critical raw materials adequate for the expanding economy and security of the United States."

As governor of the State which produces half the Nation's oil, I am deeply concerned with the effect currently excessive petroleum imports are having upon our national defense and the economic stability of our State and Nation.

It is no exaggeration to say that world freedom depends upon the economic and military strength of the United States. Excessive oil imports today are undermining both.

To the extent that oil imports cease to supplement and begin to supplant domestic production in supplying domestic demand, we are becoming dependent upon sources which may be inaccessible in time of war for our No. 1 munition of war. Excessive oil imports retard exploration and drilling in the home industry, the full effects of which do not always appear for several years.

Particularly dangerous to our national welfare is the increasing reliance upon cheap Middle East sources for oil to meet our own consumptive demands. The unreliability of this source is hardly open to question; even without the consideration of war, the fear of expropriation resulting from nationalist uprisings increasingly dominates the policies of the international companies operating there.

One might ask, then, what possible benefits accrue from the present national policy of permitting the gradual displacement of domestic oil activity by heavy imports. Does this Nation have any objectives more important than the maintenance of healthy industries at home which are vital to its security?

Essentially, our growing reliance upon foreign oil is defended upon two grounds:

(1) We are told, first, that imported oil conserves our limited resources, that America is running out of oil.

(2) We are told that heavy imports serve world trade objectives. This argument is summed up adequately in the Bell report (Report to the President by the Public Advisory Board for Mutual Security) in these terms: "If this country does not soon take measures to facilitate an increase in imports, United States exports will decline and American industry and agriculture will be seriously affected.

Throughout the history of the oil industry, there has never been a shortage of self-styled experts who had us running out of oil. It is not enough that we continue to discover year by year more oil than we produce, so that proved reserves stand today at all-time highs. Nor will these prophets of doom accept assurance in the knowledge that it is impossible to run out of any such resource overnight, that long years of warning necessarily precede the depletion of this resource. But only those with a vested interest in ignoring facts can dispute that huge reserves of coal, oil shales, and natural gas, all of which can be converted into oil through technology, lie beyond the reserves of oil.

The problem in recent years has been not one of finding a substitute for a limited natural resource but rather keeping ambitious bureaus in the Federal Government from subsidizing synthetic replacements before they are needed. Economic history shows that long before the depletion of any resource a dynamic and free people have replaced it with a better substitute. "In a very real sense," to use the words of the head of the Nation's largest oil importing company, "raw materials do not exist; they are created."

Nor do the lofty free-trade motives of which we hear so much these days apply in the case of petroleum.

Little of the money for imported oil goes toward increasing foreign purchasing power. Principal beneficiaries are five large American oil companies. Source countries receive no more than 50 percent of the net profits shown on these companies' books from their production operations abroad.

American exporters, therefore, can expect very little help from dollars dispensed abroad for imported oil. The often-cited example of heavy Venezuelan purchases here are largely the result of her need for large equipment with which to expand her oil output. The other recipients of our dollars for oil, for the most part, are among our poorest foreign markets.

Petroleum, according to Commerce Department figures, has done far more than its share toward balancing our trade with the world. In fact, while imports of all commodities have grown 4.2 times the size of the prewar rate, oil imports have grown by 13.5 times. While exports of all commodities have increased 5 times, oil exports have increased by but 2.3 times.

On the basis of all evidence available to me, therefore, I have concluded that America has or should have no objectives justifying the very considerable damage to her welfare arising out of currently excessive petroleum imports. No economic or defense interests will be served by the continued displacement of domestic oil enterprise with foreign production.

The State of Texas, now suffering the dire consequences of a reduction in allowable output during the past 5 months of more than 400,000 barrels daily, cannot be expected to serve indefinitely as the balance wheel to oil surpluses the world over.

Failure of oil imports to adjust to demand conditions, as the production of oil and other commodities in this Nation is required to do, must be taken as evidence that the problem cannot be solved without some form of national policy implemented by congressional action.

Sincerely yours,

ALLAN SHIVERS.

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